AVICULTURAL MAGAZINE

CONTENTS

	PAGE
Breeding Results at the Keston Foreign Bird Farm, Season 1954, and Some Recent Acquisitions (*with plates*), by E. J. Boosey	45
Notes on European Wild Pigeons, by D. Goodwin	54
Breeding of the Red-tailed Black Cockatoo (*with plates*), by K. C. Lint	86
Red-crested Cardinals, by D. H. S. Redon	88
Some Very Miscellaneous Winter Notes, by the Rev. J. R. Lowe	90
Council Meeting	92
Studies on Great Crested Grebes, by K. E. L. Simmons	93
London Zoo Notes	103
British Aviculturists' Club	104
News and Views	106
Review	107
Memorial to the late Duke of Bedford	108
Note	108
Correspondence	108
Receipts and Payments Account	110

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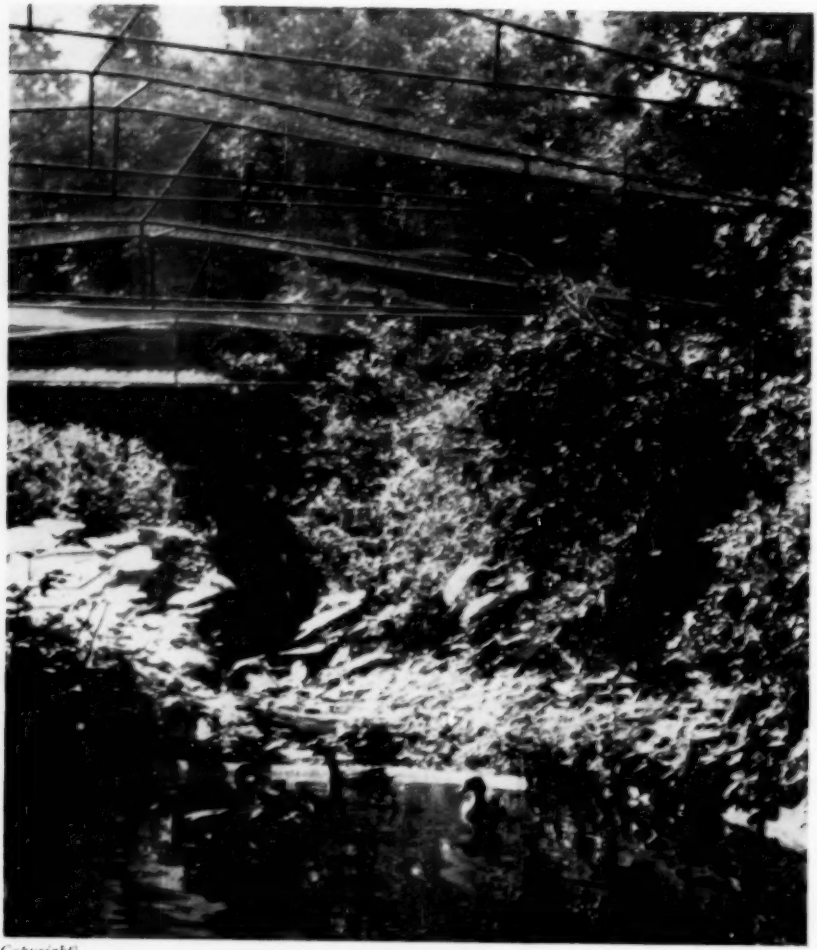

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PART OF NEW 70 FT. POND ENCLOSURE AT KESTON.

AVICULTURAL MAGAZINE

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BREEDING RESULTS AT THE KESTON FOREIGN BIRD FARM, SEASON 1954, AND SOME RECENT ACQUISITIONS

By EDWARD J. BOOSEY (Keston, Kent, England)

Despite a summer which, for sheer vileness, beat all records even for our climate, our breeding results at Keston were not nearly as bad as I had feared they might be.

The arctic cold of mid-May caused, as I have already recorded, the death in the nest of three young blue Ringnecks, while Magpies dealt successfully with the fourth, after it was fledged, by pecking it as it clung to the wire netting and inflicting a chest wound from which it subsequently died.

For the first time for many years our old pair of lutino Ringnecks not only reared no young ones, but did not go to nest at all. If this was because of the weather, one can hardly blame them, but I suspect that a contributory cause may have been the fact that they had only just been moved into a new aviary. This unfortunately was necessary in the case of many of our breeding pairs of parrakeets as all our aviaries are in process of being completely reconstructed, with enlarged flights, having metal instead of wooden framework, and many of those to house breeding pairs were not ready for occupation until March.

Two nice young lutino Ringnecks were reared, however, by a new green hen mated to a lutino-bred cock bred here a few years ago, and they reared two green young ones in the same nest.

An Alexandrine mated to a cock Alexandrine × lutino Ringneck hybrid had infertile eggs.

One pair of Layard's had clear eggs, while the other pair hatched a single young one which, when about half grown, succumbed to the cold at the same time as the three young blue Ringnecks. Both pairs are very young, however, and I hope may do better next season.

These attractive little members of the Ringneck family have always

been avicultural rarities, partly, no doubt, because of their restricted range, which is confined solely to Ceylon. As far as I know, they have only once been bred in this country.

The " hen " of a " pair " of Plumheads eventually turned out, as so often happens with these birds, to be a cock. Another one, however, obtained at the same time, is definitely a hen, and this is fortunate, as she is mated to our matchless little cock lutino Plumhead. With his particularly rich yellow body colour ; head like deep rose velvet ; and small bright scarlet wing-patches, I think I have never seen a lovelier little bird of any kind, nor a more perfect specimen, and I only wish that Plumheads were not at the best of times such very shy breeders.

The lutino three-quarter Alexandrine, whose grandparents were a cock Alexandrine mated to a hen lutino Ringneck, has improved out of all knowledge after her last moult, and is mated to a particularly fine young normal green Alexandrine, bred by one of our members, Captain Veitch, in whose aviaries I think her grandfather was also bred. Originally she did not seem to make the progress she should, and I eventually discovered that she was being badly bullied by her brother who, not being a lutino, doubtless has better sight than hers. I cannot ever recall a similar case of bullying among parrakeets, still immature, that were members of the same brood—in this case, too, just a single brother and sister.

A few Bourkes were bred, and Elegants, but the most satisfactory Grass Parrakeet result was the rearing of nineteen young Turquoisines. The building up of a breeding stock of these beautiful little parrakeets has been a rather long and laborious process, as we started a few years ago with an imported nucleus consisting only of one pair and an odd cock. This, however, is much better than just a single pair, as one can at any rate hope to breed a mate for the odd cock, and as their progeny can then be mated back to those of the original pair one does not have to resort to direct brother to sister in-breeding.

A cock Elegant mated to a hen Turquoisine reared three young ones, a hen and two cocks. Like most hybrids they are fine specimens and the cocks are distinctly handsome, being like very brightly coloured Elegants with a quite vivid orange patch on the belly and the suggestion of a red shoulder patch.

Two pairs of Splendids, obtained from a Welsh breeder, failed to propagate their kind owing to an excess rather than a lack of zeal. Both hens took at once to their nest-boxes, and were only seen again when they had been practically crowded out by their own eggs—the two boxes being found to contain no fewer than thirty-one eggs between them !

Our old breeding pair of Pileated Parrakeets had a brood of three, making twenty-two young reared since they have been at Keston.

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MALE ALEXANDRINE × LUTINO RINGNECK HYBRID.

(This bird, mated to a pure Alexandrine hen, was the father of the lutino three-quarter Alexandrine.)

To face p. 46

A brother and sister pair of their progeny reared a brood of four of excellent size, but they were badly plucked in the nest. Another couple of the old pair's young ones I had kept, hoping they would prove a pair, turned out to be two cocks.

A fine pair of Browns bred at Woburn, and which we have had for some years, again did nothing beyond pretending they were going to breed when they were first given their nest-box, but a sister of the hen's mated to a cock Golden-mantled Rosella, reared a handsome brood of four young hybrids.

A number of Golden-mantled Rosellas and Stanleys were bred, and a young cock of the latter species is of particular interest, as he is what I believe is known as a " dilute "—that is to say in appearance he bears the same relationship to a normal Stanley as a silver Zebra Finch does to an ordinary one. I have never seen one like him before, and he is distinctively attractive, the red being the usual bright red though of a slightly lighter shade, while the green is much paler than usual, with a yellowish hue, and the mantle is only faintly marked.

Two pairs of Meally Rosellas were obtained too late in the year to breed.

An adult pair of Princess of Wales did not go to nest, while a young hen bred in Wales and mated to an imported adult cock, behaved in a most disappointing manner. She went into the nest-box and prepared it for the reception of eggs, after which she retired into the shelter where she laid a full clutch of eggs from the perch—all of them smashed, of course. She then once more entered the nest-box and, as the late Duke used so aptly to put it, proceeded to incubate the abstract idea of eggs !—and she subsequently died.

A young pair of Manycolours did not go to nest, and a cock Hooded Parrakeet shared an aviary with a hen Turquoisine, but her eggs as one would expect, were clear. He is now with a recently obtained hen Manycolour with whom he is very pleased, and I hope they may rear a brood of synthetic Paradise—almost, I believe, indistinguishable from the genuine article—and a cross which the late Duke was hoping to obtain from this actual bird, at the time of his death.

A number of Redrumps were reared, mostly greens, but a few yellows as well.

Our parrot population consists of a female Yellow-fronted Amazon whose elderly husband recently died ; two Blue-fronted of doubtful sex, as well as a pair, the hen of which (bred here before the war) reared a brood of four a few years ago when mated to a former husband who has since died ; four Cuban Amazons too young as yet, I think, to breed ; several Greys ; a Senegal ; and finally a very small Amazon bought several years ago from a local pet shop, and which I still find hard to identify with certainty, though I think it must be the All-Green from Jamaica.

A loss which caused me the maximum amount of regret was the escape of a particularly fine and certain cock African Grey Parrot. He and the hen were obtained as grey-eyed young ones during the brief lifting of the parrot ban, and had developed into a really splendid and very devoted pair which, incidentally, should have been about ready to breed next season. The great thing about them was that they were young, and had never been spoiled for breeding purposes by caging, and they were consequently the most promising couple.

They had been moved into a new and longer aviary, and, unobserved, had bitten two holes in the roof of the flight, although it was made of brand-new half-inch mesh netting. Both were in the aviary one afternoon at 3.30, but by 4.30 the cock had completely vanished and has never been seen or heard of from that day to this, despite the offer of a substantial reward to anyone returning him alive. It is, of course, almost unheard-of for a mated cock parrot at liberty to desert his hen if she is still in the aviary, and this bird's complete disappearance will always remain to me an unsolved mystery.

I was afraid that we should be left with a hen Grey in breeding condition, and nothing to mate her to, but by a great stroke of luck we were recently offered *two* cock Greys.

This seemed altogether too good to be true, and we wondered if they would really turn out to be cocks. However, as soon as they were out of their travelling boxes it was obvious at once, from their large heads and massive legs and feet, that they were indeed two cocks.

They are promising specimens for breeding purposes, as they are not tame, have certainly not been caged for long, and I should say are wild-caught adults.

Late last autumn we obtained two more Greys that proved to be the typical tame hand-reared grey-eyed youngsters which it is a great temptation to make pets of!

They were sold as a pair, but although one is slightly larger and more masculine-looking than the other, I have an idea that they are really both hens. If they are our stock of African Greys now consists of two pairs and a spare hen.

A pair of Roseate Cockatoos, the hen of which was bred here some years ago, reared their usual annual brood of three—two hens and a cock, and we kept the young pair to increase our stock, and hope to obtain unrelated mates for them.

A fine male Citron-crested Cockatoo remains unmated. I doubt if we shall ever get a hen of his own kind for him, which is a pity, as they have never been bred, but failing that, a hen Lesser Sulphur-crested would be the next best thing, and I should be very glad to hear from anybody who has one for disposal. They can be sexed by the eye-colour; the cock's being almost black, and the hen's brown.

A fair number of Cockatiels were bred.

As to lovebirds, we have Fischer's and both green and blue Masked, and as usual with the spectacled lovebirds, they proved difficult to sex with certainty. Broods of both species were reared, however, as well as some young from a blue Masked mated to a green. Pairs of Peachfaced were obtained too late to breed.

Many thousands of Budgerigars of all colours were bred, and the demand for rainbows—a very beautiful colour variety which originated here during the war, proved to be world-wide. In addition to the Continent, they were exported to India, Japan, South Africa, Canada, and America ; in the case of the last two countries, of course, in small quantities, as only a few can be taken in personally by aviculturists.

The only Grass Finches we put up to breed were Gouldians, and a small stock of these did quite well, rearing about a dozen young ones. Other finches reared included normal white, silver, fawn, and chestnut-flanked Zebra Finches, as well as a few Saffron Finches and white Java Sparrows.

Several of the very handsome Australian Crested Bronze-winged Pigeons were bred and also some Necklace Doves.

Two pairs of the pretty little Cape or Namaqua Dove which, except for its longer tail, is scarcely larger than a Diamond Dove, although in excellent feather, failed to come into breeding condition which, considering the vile summer, was hardly to be wondered at. I have an idea that a really prolonged spell of hot weather would be necessary to bring these attractive little doves into breeding condition. They have the reputation of being lethargic aviary inhabitants, but I noticed that they became considerably livelier on the rare occasions when we had a few fine sunny days.

Recent additions of the dove population include a pair of Triangular-spotted Pigeons, a pair of Indian Green-winged Doves—beautiful but desperately wild—and also a pair of the very lovely little Australian Plumed Ground-Doves. These doves belong to the genus *Lophophaps*, and I think I am right in saying that there are only three species, namely *plumifera*, *ferruginea*, and *leucogaster*.

Our pair are of the latter race or species—the White-bellied Plumed Ground-Dove—and I am not certain whether *plumifera* and *ferruginea* have ever been imported. In any case, even the White-bellied, which has the widest range of the three, is seldom obtainable, and always expensive to buy.

They are being wintered in a large cage in a heated birdroom. As one would expect from their purely terrestrial habit, they never perch, but spend all their time on the floor of the cage, which has a thick layer of peatmoss upon which they are periodically given a small square of turf. We shall try and give them an aviary in which they are the only ground birds, because although they look so small and

harmless, they are said to bully other ground birds such as quail, etc., and also to persecute their own wives.

They inhabit rather barren and very hot parts of Australia, and delight in sun-bathing on rocky ledges. We propose to let them share an enclosure with a pair of Elegants which are in one of our terrace aviaries facing due south in a very sheltered position. As they hardly ever fly, they will not interfere with the Elegants at all, and we propose to put a layer of sand over half the flight and at the back of it construct a miniature rockery of flat slabs of stone on which they can sunbathe—provided there is any sun to bathe in! It will not be necessary to supply any nesting receptacle as they are so truly terrestrial that their nest merely consists of a shallow grass-lined depression in the ground.

During the spring we received two birds which we have never previously had at the farm. They were sold as Yellow-headed Troupials and Military Starlings, but on arrival turned out to be two kinds of Marsh Bird, namely the Yellow-headed (*Agelaius icterocephalus*) and the Red-breasted (*Leistes superciliaris*). Both have a simple but striking colour scheme, the former being jet-black with a lemon-yellow head and a small black area round the eye, while the latter are dusky black with the upper half of the breast bright crimson. Temperamentally, however, they are very different, the Yellow-headed being an extremely active aviary inhabitant with a cheerful ringing " Plink . . . plink . . . plink-plonk-plink " call-note which is frequently uttered, while the Red-breasted proved silent and lethargic, though possibly they would liven up a bit in a spell of really hot weather. Also they spend most of their time on or near the ground, so that one sees little of the bright crimson of their underparts. Both species proved partly insectivorous and partly seed-eating.

A pre-war enclosure containing a pond has recently been roofed over, and is now a really large aviary about 70 feet long by 20 feet wide, by 12 feet high. During the past summer this contained among others Scarlet Tanagers, Giant and Jackson's Whydahs, Shamas, Red-breasted Marsh Birds, Black-headed Orioles, Spreo and Purple-headed Glossy Starlings, Necklace Doves, and Australian Crested Bronze-winged Pigeons. Both the last named successfully reared young. Most of these birds are spending the winter in a smaller aviary with a heated shelter, and will be put out again next spring, when we hope some of them will breed. Most of them were newly imported, and, of course, the more difficult breeders seldom make any attempt to go to nest until they have been in the country for at least a year.

The Spreo Starlings are of considerable interest. They were obtained from the Continent simply as " Spreos ", which we naturally assumed to be the most beautiful and at the same time most freely imported species—namely the Superb Spreo (*Spreo superbus*). On arrival they were very dull-coloured, being simple dark bluish-green, with a

greyish crown of the head ; the lower breast and belly dark chestnut some creamy-white on the inner webs of the flights and hardly any metallic gloss on the plumage. They looked, in fact, like young birds not yet moulted into adult plumage ; and this is what we assumed them to be.

We have now, however, had them for the best part of nine months, and although they have done a complete moult, their appearance has not changed at all, so it seems certain that they are actually not *superbus*, but the Beautiful or Chestnut-bellied Spreo (*Spreo pulcher*)—ranging across Africa from Eritrea to Senegal, as they tally exactly with Bannerman's description of this race in vol. 2 of his *The Birds of Western and Equatorial Africa*. He describes their nesting arrangements, and it is interesting to note that they construct a sort of outsize Weaver's nest—spherical and made of grasses with the entrance near the top, and placed in a bush—as I had imagined that all starlings nested in a hole of some kind, either in a tree or building.

Ours are, judging by their behaviour, an obvious pair, and have been seen carrying nesting material, and as I doubt if this race has ever been bred, we hope to have a shot at it next season. Although they have the intelligent attractiveness of all the Starling family, it is difficult to see why they were called "The Beautiful" since, judging by descriptions of the others I have read, I should say that they are probably the least beautiful of all the Spreo group.

Perhaps the Purple-headed Glossy Starlings were the most spectacular, as they made full use of the great size of the aviary and looked really magnificent in flight with the sun—on the few occasions when it consented to shine—glittering on the ever-changing hues of their brilliantly-metallic plumage ranging through green and blue to purple. Their flight in a really large aviary was interesting, starting with powerful wing-beats and ending in a glide before alighting. . . . So, too, was the flight of the Crested Bronze-winged Pigeons which is swift and powerful, with the tail momentarily raised high over the back on alighting. Their wings make a quite loud whistling sound in flight.

Among permanent residents in the aviary are Mandarin and Carolina Ducks, Oystercatchers, and Ringed Plover—the latter a trio of doubtful sex, though probably all cocks.

The Mandarins and Carolinas came from Woburn, and were very kindly given to me by the late Duke of Bedford shortly before his death. Although they are full-winged, they hardly ever fly except when having fun and games in the spring. Then they sometimes take off, and after flying low for a short distance, land on the pond with a splash.

The Oystercatchers are particularly beautiful in flight with their black wings so strikingly barred with white. In addition to their

attractive appearance they are lively and interesting aviary inhabitants, forever examining and probing into everything with their long slender bills, and they make full use of the miniature shingly paddling beach which our General Manager, Mr. W. D. Cummings, under whose care they are, has fixed up for them at the shallow end of the pond. Here they probe and bathe to their hearts' content, as do the Plover, though these are chiefly interesting in bathing. The Oystercatchers' lovely wild whistling call is sometimes heard during the day, but chiefly at night when the moon is up.

When they first arrived they were somewhat lame, and their normally orange-yellow beaks were almost black, and rather brittle. Now they are in lovely condition with the colour back in their beaks, and have fully repaid Mr. Cummings for the care he has lavished upon them.

They seem to like a varied diet, including insectivorous mixture, bread and milk, and, much to my surprise, groats and wheat, as they are about the last birds I would have expected to eat hard corn. Perhaps their favourite food is live gentles, of which they have a generous daily allowance. They also eat snails, and are very fond of shrimps and cockles, which they are given every other day. Cockles are, of course, one of their chief items of diet in a wild state, and I have often wondered why these birds were given a name which suggests that they spend their time rushing madly about trying to catch the nimble oyster !

The Ringed Plover are most attractive and dainty little waders to have in a suitable aviary, and require the same diet as Oystercatchers, with the exception, of course, of corn, and I have never seen them tackle shrimps, though they will eat cockles.

Our two other large planted aviaries contained a rather miscellaneous collection of birds, including Crested Bronze-winged Pigeons, Necklaced and Cape or Namaqua Doves, a couple of cock Short-billed Minivets, Napoleon Weavers, Grenadier Weavers, Goldfinches, two cock Yellow-headed Marsh Birds, Saffron Finches, Giant Whydahs, Lavender Finches, and finally a couple of Grey Singing Finch × Canary hybrids—most beautiful songsters. Young were reared by the Crested Pigeons, Necklace Doves, and Saffron Finches.

One of these aviaries contained a pair of pure-bred Amherst Pheasants, and the other a trio of Goldens, the cock of which was still in immature plumage. The Amherst's eggs were placed under one of the Golden hens, and several chicks hatched, which she successfully reared without any trouble in the same aviary as her sister and the immature cock, just brooding them at night in whatever part of the aviary she fancied—usually under a thick elder bush.

Perhaps the most rarely imported birds on our farm are four species of South African Warbling Finches of the genus Poospiza,

namely: The White-throated (*Poospiza melanoleuca*), the Chestnut-and-Black (*P. Nigro-rufa*), the Pretty (*P. ornata*), and the Ringed (*P. torquata*).

Only the Pretty is at all finch-like, resembling a miniature Chaffinch of rather cinnamon colouring, while the White-throated and the Ringed remind one respectively of a small Cole Tit and a miniature Pied Wagtail. The handsomest of the four and also the best songster is the Chestnut-and-Black, which in addition to these colours has areas of pure white and dark slate-grey in its plumage.

Mr. Yealland tells me that the London Zoo has never had a specimen of the Ringed, so it seems probable that ours are the first ever to be imported into this country.

Although the birds of this genus have been called finches, it is a rather misleading name, and I doubt if any of them would live for long on the normal finch diet of seeds and green foods. It is true that ours eat a certain amount of seed, but they are also given insectivorous mixture, bread-and-milk, and gentles, all of which they eat with relish, and some appreciate a thin slice of apple pushed through the wire netting close to a perch.

We only ever had one White-throated Warbling Finch, which we eventually parted with as there seemed no chance of ever getting a mate for it.

Of the other three species, the pair of Ringed were given an aviary to themselves. This faced due south, and had a tangle of wild clematis growing up the back, in addition to which a bundle of gorse was nailed up under overhead cover in a secluded corner. The birds themselves were in perfect condition, and I am sure the fact that they made no attempt to go to nest was due to the wretchedly cold and sunless summer.

The Pretties and the Chestnut-and-Blacks shared a large planted aviary with various other birds, including the pair of Amherst Pheasants.

The hen Chestnut-and-Black, although she had a perfectly good husband of her own, perversely mated herself to one of the three Pretties (of whose sexes we were uncertain), and constructed a typical cup-shaped finch nest high up in a bush. This, however, was later found destroyed, possibly having been crash-landed upon by the hen Amherst, who was rather inclined to fly up wildly when she was being too hotly pursued by her husband. This, incidentally, is a disadvantage with pheasants in an aviary containing small nesting birds.

The three Pretty Warbling Finches were then transferred to another planted aviary and nested, and I think the hen started to sit. Here again, however, the nest came to grief—this time possibly destroyed by a pair of Saffron Finches who became very aggressive to all and

sundry when they had young in the nest, or else again by a pheasant landing on top of it, as there was a trio of Goldens in the aviary.

However, we still have the Ringed, the Pretties, and the Chestnut-and-Blacks, all wintering together in an aviary with a heated shelter, and shall try next season to give them all aviaries to themselves, as—except for the odd stroke of luck now and again—I never think much in the way of breeding results can usually be expected in a mixed collection.

* * *

NOTES ON EUROPEAN WILD PIGEONS

By Derek Goodwin (Virginia Water, Surrey, England)

This article has been written in response to a request for some information on European wild pigeons.* With these as the central theme, I have also ventured to deal with some aspects of general interest to pigeon-watchers or pigeon-keepers, and to a large extent equally applicable to birds of this group elsewhere. I have not discussed the feeding-behaviour at any length, since so far as I know it does not differ in any essentials from that of the Feral Pigeon (Goodwin, 1954) except in the case of the Woodpigeon. This species has a special movement (Heinroths, 1926–7) for plucking berries, buds, etc., and probably also has innate reactions enabling it to recognize certain tree-foods.

There is much difference of opinion as to whether such names as Stock Dove should be written thus, or as Stock-dove, or Stockdove. I have no strong opinion on this matter, and if in this paper I have used the last form most often, it is simply due to the greater ease of typing it so.

I have used the now popular English names, but it should be mentioned that in bygone days the Woodpigeon was known as Ring-dove and still is in some bird-books. It is the Cushat of the Scots. In many poems by different authors, the term " Stockdove " almost certainly refers to this species. The Stockdove itself is locally known as Rock Dove or Blue Rock Pigeon, causing confusion with *Columba livia* which is properly so-called.

Some behaviour patterns of breeding pigeons

In this section I propose to describe, and where necessary, briefly discuss, some characteristic forms of behaviour that are—with the possible exception of driving—common to all the European species

* I have used capitals for species names. Where I have used the word " pigeon " or " dove " uncapitalized, it is used as a general term to cover any or all of the *Columbidae*.

The line sketches are merely to give a general impression of the subject and have no pretention to art or detailed accuracy.

and to most other pigeons as well. These behaviour patterns are all characteristic of some stage of the breeding cycle, although in the case of display flight and the bowing display by no means rigidly confined to it. Specific differences in the bowing display and display flights are described briefly under the species headings, and will not be discussed here.

The Bowing Display

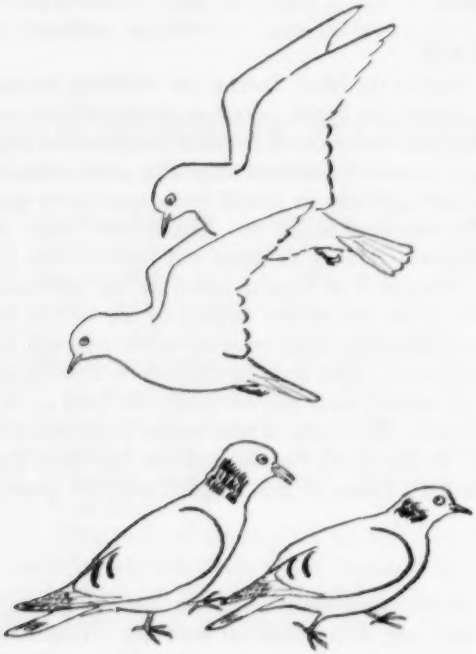
In this the displaying bird, facing (or walking around) the object of its display, lowers its head, utters a characteristic cooing, and by special movements or erection of feathers exhibits the display markings on neck, wings, or tail. Contraction of the pupil usually takes place. This display differs greatly in detail from species to species, the bow may be rapidly repeated as in the Turtledove, slow and deliberate as in the Stockdove, it may or may not involve the presentation of wings or tail. Always it is frontal when at full intensity, although a tendency to flee from the object displayed at, or the latter's moving away from the displaying bird, may at times prevent this from being immediately obvious. The bowing display is always self-assertive in character, but is usually only shown when the bird is, to some degree, sexually motivated. In doves of the genus *Streptopelia* it seems to be mainly sexual. In the Rock Pigeon and the Speckled Pigeon (*Columba guinea*) low intensity forms of this display may be purely threatening or defensive.

Nest-calling

This is the term commonly used for cooing given by a pigeon, eager to begin nesting, at a potential nest-site. When such a bird has discovered a suitable place it adopts a crouching posture with tail and rump somewhat raised, lowers its head, and utters a characteristic cooing which is, in many species, very similar to the ordinary advertisement "song". Twitching of the folded wings and nodding of the head usually accompany this. Both sexes nest-call, but commonly the male initiates such behaviour and shows it at higher intensity than the female. Lone pigeons—especially solitary confined birds in full reproductive condition—may nest-call, but usually this behaviour is only indulged in when the mate is near by, and the latter normally soon joins the nest-calling partner. Mutual fondling and calling on the nest-site then follow, at any rate if the female approves of her mate's choice, as she usually does. Whilst thus on the site together, the pair seem to be in an absolute ecstasy of mutual affection, and this behaviour probably functions to forge a strong emotional bond between newly paired birds, as well as reinforcing such a bond in older pairs. It is repeated at subsequent visits to the nest-site, but the nest-calling and mutual ecstasies soon largely give way to nest-building.

Driving

In the Rock Pigeon (and its domestic descendants) and the Stockdove this is commonly seen for several days prior to the female laying the first egg. Her mate follows her wherever she goes, pecking, usually



Male Stockdove driving his mate (*a*) in flight, (*b*) on ground.

quite gently, at the top of her head. The intensity of driving varies greatly. Some male Domestic Pigeons give neither their mates nor themselves any rest at this period, others only drive intermittently and in a half-hearted manner. The male Stockdove is said (the Heinroths, 1927–8) to strike his mate fiercely with his wings when driving. This I have not yet seen, and I suspect the statement—which the Heinroths give second-hand—is based on the aggressive encounters of cock and hen Stockdoves in the early part of the nesting-cycle being mistaken for true driving. If the driven female goes to the nest-site she is chivvied no further.

It is commonly supposed that the driving male is deliberately trying to force the female to go to the nest-site. The Heinroths (1949) on the grounds of their long experience with Domestic and Rock Pigeons, consider this so. I am inclined to doubt it. Although the male stops

driving if the hen goes to the nest, his driving does not appear to induce her to go thither. So far as I have seen, the male never drives when the pair are isolated from others of their kind, even if they are at full liberty. The stance adopted by the driving male and his apparent visual fixation on the female's head are suspiciously suggestive of his normal behaviour immediately prior to and during copulation. Furthermore, it sometimes happens (the Heinroths, 1949) that the driven female will suddenly stop dead still and the mating ceremonial follows. These facts make one suspect that the causation of the male's driving might be in a desire for coition. But such a theory is difficult to reconcile with the lack of driving in isolated pairs. That, as Whitman (1919) suggested, the sight of other pigeons near by arouses in the male a feeling of jealous possessiveness towards his mate, and this emotion elicits the driving, would fit the observed facts, but it is difficult to prove or disprove. I have not seen driving in other species, with the possible exception of the Barbary Dove, and in this species too I have only seen it when others were about. The male Barbary Dove shows more aggressiveness, or at least shows it more obviously, and I am not at all sure his behaviour is really homologous with that of the Rock Pigeon and Stockdove. Still less am I convinced that this is the case with various reports of driving in other species that I have heard and read. In some, at least, the observer may have been mistaken, as I now think I was over my Laughing Doves (Goodwin, 1947), and misinterpreted aggressiveness for true driving.

Turning now from the motives activating the driving male to the biological function—if any—I can only think of two that seem even faintly plausible. Driving might prevent the hen from being fertilized by another male. That the hen at this stage shows no sexual interest in strangers if her mate is present does not absolutely nullify this hypothesis, since such indifference on her part might have co-evolved with masculine jealousy. Secondly, if such behaviour on the part of the male actually does make the female spend more time at the nest-site, then it might be of use in connection with nest-building (q.v.) or protection of the nest from strangers. The Heinroths (1949) show that driving occurs most intensely in young pairs or in birds nesting at a new site, and conclude that its function is to impress (presumably on the female) the whereabouts of the nest-site " dass ein Einpragen des Nistortes bedeudet ". This I find difficult to reconcile with the fact that a lone pair of Domestic Pigeons do not drive even under such conditions. Also it seems unlikely that the hen needs " reminding " of the nest's whereabouts. The excellent memory of a hen pigeon for any place whither she has gone in company with her mate and indulged in nest-calling with him, is easily proved by means of a hand-reared hen Domestic Pigeon " paired " to her owner.

Nest-building

In the European species—and all other pigeons for which nest-building has been described—the male collects the material and the female builds the nest. In the Domestic Pigeon (the Heinroths, 1949) and perhaps in other species, the female may bring a few twigs, but her contribution in this way, presuming her to be heterosexually paired, is negligible. The chief stimulus eliciting the collection of nest-material in pigeons is the mate sitting on the nest-site ready to build. In normal pairs the builder is always the female and the collector the male. If, however, a hen pigeon receives the appropriate stimulus, as she will do if she is paired to another female, then she will show the otherwise masculine behaviour-pattern and seek for and carry material to the sitting bird. As with gulls and some other birds, nest-building in pigeons appears not to be fully emancipated from its (presumed) origin as a displacement-activity. If during incubation the female is at all reluctant to quit the nest when the male comes to take his turn, he will often go and gather a twig for the nest. My friend Mr. Bertram Stone, pointed out to me that this is particularly liable to happen—at any rate with Domestic Pigeons—at the moment that the young are actually hatching, when the female is often reluctant to leave them.

Male Pigeon (any branch-nesting species) giving building material to female. (For explanation see text.)

In tree-nesting pigeons the male always walks over, or alights on, the female's back, and presents the twig to her over her shoulder (see sketch). Leaving aside possible psychological implications, this behaviour may be of use in testing the strength of the growing structure which will later have to support the weight of both young and adult. Also in branch-nesting pigeons the siting of the nest might at times make a frontal approach difficult. The Rock Pigeon, Stockdove, and Speckled Pigeon also show a strong tendency to present nesting material to the female from behind, even although this is often difficult

to achieve if the hole or nook used is on the small side. This is an additional reason to those given by the Heinroths (1949) for supposing branch-nesting to be the primitive condition in the Columbidae and hole-nesting a recent development so far shown only in a very few species.

Most pigeons use twigs, dead roots, stems, and so on, for their nests. They avoid soft substances and choose twigs of a tough and wiry nature if possible. Hence if by chance it comes upon pieces of wire of suitable length these supply a " super-normal " stimulus to the material-seeking bird, and are taken eagerly. Hardly a year goes by without someone finding a pigeon's nest built entirely of wire, and announcing the fact in the press with many foolish comments about the bird's "abnormal " choice of material. The Woodpigeon gathers much of its nesting twigs from the tree, seizing the bare twigs and breaking them (if it is lucky) with a similar movement to that used when plucking berries or acorns. At times, however, it forages for material on the ground, as do all the other European species.

The European Species

The Woodpigeon (*Columba palumbus*) is the largest, and in Britain the commonest, of the European wild pigeons. It is about the size of the average Homing Pigeon, with a proportionately heavier body, larger tail and shorter wings and legs. It is larger than most of the Feral Pigeons in British towns, but a good deal smaller than " show " specimens of most domestic breeds. In appearance few birds can surpass it. The general colour of the upper parts is soft grey, strongly tinged with bluish on rump and head, but less so on the wings. The breast is a soft mauve-pink (one of the many different colours for which most bird books use the term " vinaceous ") shading to near white on the belly and creamy-grey on the flanks. There is a white patch on the wing which is conspicuous in flight. A white patch on either side of the neck is set off by an area of iridescent green just above it (see sketch). The bill is golden-yellow, with a white cere and pink gape-edges. The irides are pale silvery lemon or greenish-white, and together with the " spilt " appearance of the pupil (said to be due to its being pear-shaped, but looking as if due to a spot of blackish pigment adjacent to a spherical pupil) rather detract from its charms. Juveniles are duller and browner, with rusty fawn breasts, dark eyes, and no white on the neck. Most females have slightly smaller neck-patches and paler pink breasts than most males.

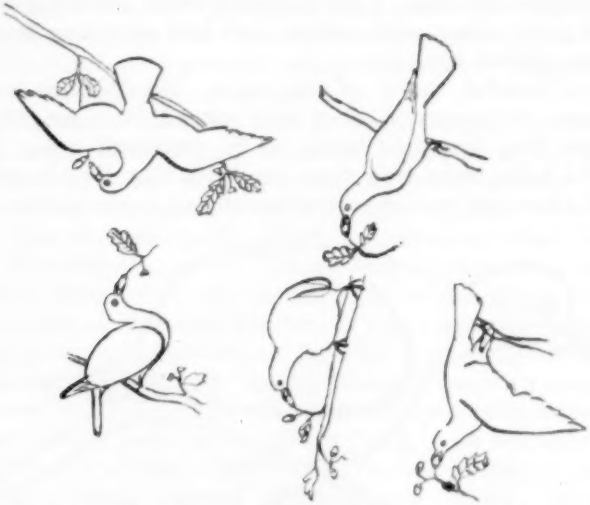
The Woodpigeon is found throughout much of Europe, western Asia, N.W. Africa, and some of the Atlantic Islands. These forms differ only slightly from that described. The other wood pigeons of the Atlantic islands, undoubtedly derived from the same stock, have now become sufficiently differentiated to rank as good species.

In some northern parts of its range the Woodpigeon is mainly or entirely a summer resident. Elsewhere it is sedentary or nearly so. It seems likely that most of the " extra " Woodpigeons coming into southern England in winter are from Scotland and northern Britain rather than overseas (see Colquhoun, 1951). Sportsmen often maintain that these " foreign " Woodpigeons differ from the English ones, oblivious of the fact that unless they had come from Asia or Africa they would not show any difference. Some of the descriptions of these " foreign Woodpigeons " that have appeared in the sporting press do not fit any species known to ornithology !

The Woodpigeon was undoubtedly a bird of the primeval European forests. It has, however, adapted itself well to the changes wrought by man, and is now common in wooded agricultural country, parkland, and even some towns, such as London and Paris. Colquhoun (1951) considers it as a bird of open country that nests and roosts in trees. In my opinion every detail of its form, deportment, and behaviour betray it as primarily a woodland bird. Heinroth (1926–27) remarks on its similarity of posture and movement to the Imperial Fruit Pigeons (*Carpophaga* sp.). Particularly revealing is the fact that when Woodpigeons feeding on the ground are disturbed (in open country) they almost invariably fly to the nearest trees (provided that these are at a safe distance from the enemy), whereas Stockdoves or Rock Pigeons feeding with them usually fly a short distance, or circle, and then drop at once to earth again. In the Orkneys the Woodpigeon has even adapted itself to nesting on the ground, but in most parts of Scotland it is noticeable that where there are few trees there are no Woodpigeons.

Although taking much of its food from the ground in the form of grain and seeds, fallen nuts and acorns, greenstuff and, I suspect, many forms of invertebrate life, the Woodpigeon feeds a great deal in trees and seems to do so by preference. It can cling and clamber among slender twigs with an agility surprising in one of its bulk. When feeding on growing acorns and berries it will often—when it can reach no more from branches that will bear its weight—hang head downwards, bracing itself with outspread wings against the foliage, in order to reach further supplies. Its arboreal habits tend in one way to increase its destructiveness since it will settle among and cling to growing grain, and after harvest prefers to alight on and feed from the stooks to gleaning from the ground. It is, however, probable that the damage it does has been somewhat exaggerated. A peculiar " anti-pigeon " cult has grown up in Britain, and as a result it is considered by many not quite " comme il faut " even to show an interest in pigeons, much less suggest that they may not be so black as they are painted. One of our leading ornithologists is never tired of declaiming that " A Woodpigeon is not a bird ". " The only beautiful thing

about a Woodpigeon is the smack with which it hits the ground when you shoot it," and so on, *ad nauseam*.



Attitudes adopted by Woodpigeons feeding on acorns or berries when all the easily-reached ones have been eaten.

In any case it is extremely doubtful if the amount of corn that the persecuted and black-listed pigeons take from our fields exceeds the amount given—in the form of bread—to the favoured and legally protected garden passerines. The latter are therefore just as harmful to the national economy. It might also be mentioned that at times of caterpillar abundance, Woodpigeons often feed eagerly on these larvae.

The Woodpigeon feeds a great deal on greenstuff, taking the buds, young leaves, and flowers of many trees, as well as leaves of clover, cabbage, dandelion, and other plants. Such foods, perhaps particularly the leaves of cabbage and kale, are relatively low in food value, and seeds and berries are usually preferred if available. Kale in particular seems to be a stop-gap if all else fails, and it is usually only in heavy snow or after a very bad acorn and beechmast crop that Woodpigeons damage it seriously. Some country Woodpigeons, and most London ones, rely to a great extent on greenfood even in the spring and summer. I have noticed, however, that the London Woodpigeons, when feeding on tree buds, usually have a near empty crop most of the day, and then eagerly search for bread (and, I think, some forms of invertebrate life) on the ground, and in late afternoon or evening fill their crops to capacity with the easily obtained but probably less valuable tree-food. A pair of Woodpigeons that visited

my garden last summer fed first on young cabbage leaves, then completely stripped three blackcurrant bushes of the ripe fruit, but did not sample the wheat I put down for them. This suggested that they had never eaten grain before, and had no strong tendency to investigate seeds of such size.

In inner London many of the young Woodpigeons get into a pitiable state of starvation when first cast off by their parents. At such times their first food seems to be greenstuff taken from the ground. I have often seen them so weak that they tottered and stumbled when they moved, yet able to fly up to the shelter of a tree

Starving young London Woodpigeon sees food.

when alarmed. Young Woodpigeons at this stage do not seem usually to follow and "copy" adults as do young Feral Pigeons (Goodwin, 1954) or at least not to the same extent. One often sees them by themselves feeding, both in town and country, even when many adults are near by and at more productive feeding grounds. Perhaps the severance of family ties is accompanied by such aggression from the parents that the young are for some while chary of approaching adults of their kind?

Certainly the breeding adult Woodpigeon is territorial and fiercely aggressive to others of its species. This aggression does not prevent many pairs from nesting quite near to each other, but as can be seen in the London parks it causes constant chasing and quarrelling. Often the birds appear to be trying to drive others away from food, but this is almost certainly not the primary cause of their anger, as when not in reproductive condition they do not do this, even though food may then be scarce. Also, although the aggressive (presumed) territory owner flies furiously at other Woodpigeons that are trying to share the food some person is giving them, it ignores the Feral Pigeons which are meanwhile getting the lion's share of the food. The very great concentration of Woodpigeons' nests in some conifer plantations may imply a lessening of aggressive and territorial

behaviour on the part of their owners. I think, however, that the reason is rather that among the dense conifers the birds are not constantly aggravated by the sight of their next door neighbours, and also in these areas they feed well away from the nesting place, whereas the London birds are constantly being tempted to " trespass " when food is being doled out in a territory.

The Woodpigeon normally nests in trees, although in towns quite often on ledges of buildings. Some horizontal, or nearly horizontal support, preferably also with some support to one or more sides, and well screened by vegetation, is the kind of site typically chosen. Early nests are thus most frequently placed in conifers, or other evergreens. London Woodpigeons, either through lack of alternative sites or of predators or both, often nest in full view in completely bare trees. The nest is the usual flattish platform of twigs, apparently flimsy, but in fact often strongly interwoven, built by most tree-nesting pigeons.

The advertisement " song " of the Woodpigeon is a musical " coo-coo, coo-coo, cuk ". Usually the phrase is repeated from two to five times, but usually ends on an abrupt " cuk ". A hurried, jumbled, indistinct version of this is given when bowing in display, and when nest-calling a deep, strained groaning note, usually disyllabic, is uttered (Goodwin, 1948*c*). When bowing in display the Woodpigeon inflates its neck, increasing the extent of white and green. If perched, or standing still, the bow is accompanied by a raising of the tail, but if walking after another bird on the ground, the bowing position is adopted without tail raising. This latter is probably in origin a balancing movement, and is usually shown after alighting (see sketch).

Characteristic upward swing of Woodpigeon's tail a few seconds after alighting.

The display flight of the Woodpigeon is a most beautiful and breath-taking performance, quite impossible to describe adequately. The bird flies forward and up, suddenly inclines its flight upwards a little more steeply, gives one or (usually) more loud claps with its wings,

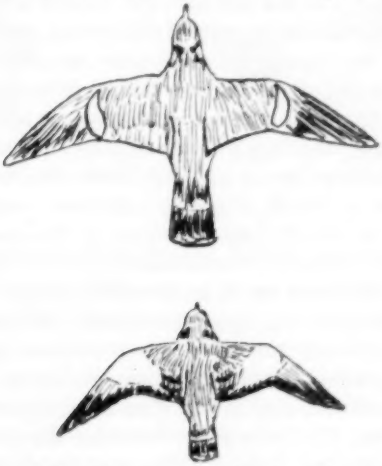
then sets them at or somewhat below the horizontal, glides forward and then somewhat downwards, often to rise and repeat the performance several times before re-alighting. This description sounds very commonplace, but the writer at least can never see the bird, just after the wing clap, appear to hang motionless for a second in the air and then shoot smoothly forward without feeling he has witnessed " something rich and strange ", frequent though the sight may be. In low intensity versions no audible wing clap is made.

Young Woodpigeons are easy to hand rear, and if really tame make delightful birds in a large aviary. If young Woodpigeons are hatched and reared under domestic pigeons they are said often to die at about six days old (Heinroth, 1927) due, it is thought, to the hard grain fed them by their foster parents. I have myself twice so reared broods of Woodpigeons successfully, but in each case the parents were at full liberty, and fed largely on wheat, not on the peas and beans usually given. Through a variety of mishaps, and mainly through neglecting opportunities, I have never had a tame breeding pair of Woodpigeons, so cannot speak personally of them in this respect. But the species has often been bred, and hybrids with Domestic Pigeons, and at least, once with the Stockdove, have been produced. Some Woodpigeons stay quite well if given liberty. I have lost many that I reared as a boy, but chiefly, I think, due to my own folly rather than the birds'. Three that at different times were staying well were all killed by Sparrow Hawks. In each case the hawk took the Woodpigeon, although dozens of Domestic Pigeons were in its immediate vicinity. One bird that was " imprinted " on Domestic Pigeons (Goodwin, 1948*a*), stayed for several years until in the end he met the inevitable sportsman, the ultimate fate of almost every large or brightly coloured bird allowed its liberty.

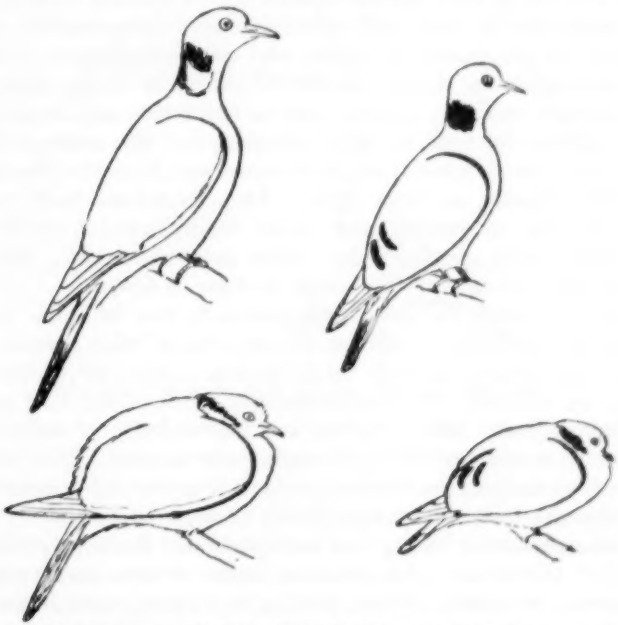
A pleasant little story that I have heard apropos of the tameness of the London Woodpigeons seems worth repeating here. An old Scottish keeper who had never travelled far from his home was—for some reason or other—taken by a well-wisher on a visit to the Metropolis, and shown all the sights. On his return he was asked what he thought the most wonderful thing in London. Without hesitation he replied, " To see a Cushat feeding out of a man's hand ! "

The Stockdove (*Columba œnas*) is smaller than the Woodpigeon and most Domestic Pigeons, but larger than the Turtledove. It is plumper and more compact in outline than the other species. It has two short inconspicuous black wing bars (sometimes a vestige of a third) and the blackish ends of its wing quills are conspicuous in flight, when the slightly paler central area of the wing (see sketch) may appear almost white in bright sunlight at some distance. On either side of the neck there is a patch of iridescent green, shot with amethyst, this patch usually extends more or less round the back of the neck also. The

breast is a soft glossless mauve-pink, this colour, despite the bird's scientific name, being less pronounced and extensive than in the Woodpigeon. The bill is dull yellowish and pinkish—appearing all pale flesh-pink at a little distance—and the legs and feet pinkish red.



Woodpigeon (upper) and Stockdove, as seen in flight from above. The unshaded areas are white in the Woodpigeon, pale grey in the Stockdove. (See text.)



Woodpigeon and Stockdove alert (upper) and at rest.

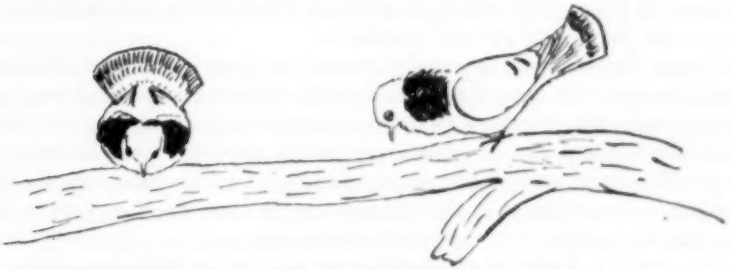
The irides are dark brown, giving the eyes a melting, gentle expression that belies their owner's character. The young are duller, with dark bills and feet, little or no gloss on the neck, and rusty fawn breasts. Most female Stockdoves are a duller blue-grey than the males, and often have a dusky tip to the bill and less clearly red feet. The young in first plumage show a similar sexual difference, and the young cock's feet and bill start to change colour before his sister's.

The Stockdove is found throughout much of temperate Europe and Western Asia, and locally in north-west Africa. It is difficult to imagine what sort of country the Stockdove originally inhabited. Possibly it was a bird of the forest-edge or of large forest clearings. It has almost certainly spread as a result of man's activities, and has in the past century increased its range and numbers in Britain and other parts of western Europe. Where circumstances permit the adult birds, at least, are resident, but in some of its breeding haunts it is a spring and summer visitor. Judging by ringing returns (Witherby, *et al.*, 1940, Delmee, 1954) the young are more prone to wander, or to migrate. In Britain the Stockdove seems to thrive wherever a fair amount of arable cultivation subsists and it can find a hole, preferably in a tree, cliff, or old building, but at a pinch even in the ground, to nest in. Parkland with old timber, inland cliffs, and derelict quarries near to cultivation usually support substantial numbers of breeding Stockdoves. Feeding is done almost entirely on the ground, usually in open fields, although the bird will sometimes feed (presumably on fallen tree seeds) on the ground in woods, and on the roadsides. The Stockdoves nesting in the Inner London Parks seem to fly right outside Inner London to feed. I have once or twice seen one or two on the ground looking for food in early morning, but this seems to be most unusual, and they do not come down when one feeds the Woodpigeons and Feral Pigeons in their sight. The Stockdove feeds on seeds, including those of vetches and many other harmful weeds, grain, pulse, small snails (probably also other invertebrate life), and greenstuff, the last not extensively except in time of dearth.

As has been said, the Stockdove prefers to nest in holes, but when these are not available, it will use the old nests of other species, or even nest on the ground among thick bushes. Records of Stockdoves building on branches are doubtless really cases of the bird using old Woodpigeon nests. Often hardly any nest is built, at other times a considerable amount of nesting material may be used. The Stockdove will use dead leaves as well as twigs, roots, etc., for this purpose. Two white eggs are laid, which take about 16 days to hatch.

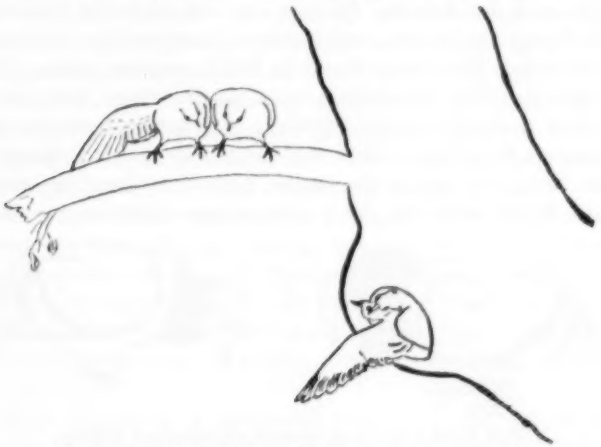
The advertisement " song " of the Stockdove is a soft, musical, but emphatic " Oo-er-oo " with some variation of tone and modulation. The nest-call is similar. When bowing in display, with inflated neck and feathers of the green neck-patch erected, it raises and fans its tail

and utters a very soft droning coo, interspersed with a double click of the mandibles. The male Stockdove " drives " his mate when she is about to lay, in exactly the same manner as does *C. livia*.



Fighting Stockdoves, bowing display " between rounds ".

It is colonial at least to the extent that several pairs will nest in the same old building (see Campbell, 1951), quarry, or belt of trees, if there are sufficient nesting holes. Over these latter there are often fierce and bitter fights. Stockdoves fighting over nest-holes go completely berserk. I once saw such a fight start between two pairs. For the first five minutes or so each bird fought both members of the other



Two pairs of Stockdoves fighting over one nest-site.

pair according to expectations, but thereafter they became so enraged that each fought whichever of the others was nearest to it, without discrimination. It seems that once it gets really " worked up " a fighting Stockdove is no longer capable of individual recognition, but reacts with aggression to the sight of any other of its kind. Often in early spring one comes upon two Stockdoves, nearly exhausted, pressing against each other and still dealing pecks and wing-cuffs. Subsequent watching may show that these are not only a cock and a

hen, but are actually paired. I suspect such incidents result from a two pair fight, the victors being left fighting each other after the " vanquished " have departed. That at least was the end of the fight mentioned above, the only one of which I have been fortunate enough to witness the actual start of hostilities.

Young Stockdoves are easily reared by hand. They will breed freely in captivity, but of the two breeding pairs I have kept one were apt to neglect their young in their eagerness to go to nest again. Most tame Stockdoves are good stayers when allowed their liberty. As they will nest in semi-darkness in boxes with a hole for entrance, it is possible to breed them in the same aviary as such birds as Jays, which is quite impossible with any branch-nesting species.

The display flight of the Stockdove consists of clapping and then gliding forward, much in the same manner as the Rock and Domestic Pigeons do, but less spiritedly. The wing claps are less loud, the wings do not seem to smite so vigorously or through such a wide arc, and the gliding is usually less prolonged.

The Rock Pigeon or Rock Dove (*Columba livia*) is the species from which all our Domestic and Dovecote Pigeons have originated. As a wild bird it is found from the Faeroes, Shetlands, Scottish and Irish coasts and the Atlantic Islands, east through the Mediterranean regions to Persia and India, and south to Senegambia, the Sudan, and southern Arabia. The form found in the European parts of its range is about the size of a Stockdove, or a shade larger, but appreciably smaller than most Domestic Pigeons. Its general colour is bluish-grey, palest on the wings which are crossed by two conspicuous black bars. The rump, or rather the upper part of it, is white, contrasting strongly in flight with the dark grey upper tail-coverts. The neck

Pair of Rock Pigeons in mutual self-assertive display.

and upper breast are iridescent green and purple, the feet and legs red or purplish red, the bill blackish, with a white cere, and the irides orange. The young are duller (see Goodwin, 1954, for details). The other forms of this species differ mainly in size (most are smaller), proportionate length of bill, and colour. This latter is darkest in those from India and Ceylon, the Sudan, and west Africa, and palest in the form found in Dhakla and Kharga oases, whose ground colour is silvery. The more southerly races—the dark Senegambian one excepted—have grey instead of white rumps. Occasional chequered

birds occur (see Goodwin, 1954). In the Azores and in China most of the Rock Pigeons are chequered, but are suspected of having originated from Dovecote or Domestic Pigeons. For notes on feeding and nesting behaviour of this species readers are also referred to my previous paper.

The Rock Pigeon appears to be primarily a bird of open, relatively treeless country, with cliffs or rocky escarpments in whose caves it can roost or nest. In many parts it is a bird of steppe-desert, and this may perhaps be its original biotope whence it has spread into other regions following deforestation and opening up of the country by man. On my first visits to the bird's haunts in north-west Scotland and the Shetlands, I was immediately struck by the general similarity in appearance of the landscape—in spite of different temperature, humidity, and plant species—with that of the Libyan coastal semi-desert where I first saw the bird in a wild state. One wonders if long ago the Rock Pigeon followed man across the face of the earth, much as the Collared Dove has done in recent years?

So far as is known, Rock Pigeons are sedentary. There is, however, reason to suspect that some movements—perhaps by young birds and analagous to the dreaded "Fly-away" of the pigeon-fancier—take place. Fair Isle has been recolonized after the species apparently became extinct there (Clarke, 1912) and recent observations (Guichard, 1955) suggest local migration in the Saharan regions. Naumann's (1833) detailed and circumstantial account of mass-migration in Germany can hardly be dismissed as pure imagination and if, as has been suggested, the birds concerned were Feral or Domestic Pigeons, then the occurrence was even more surprising.

The voice and displays of the Rock Pigeon do not differ from those of its domestic descendants, except in so far as some of these latter may be incapable of normal flight or movement. Those few that I have heard cooing (in Egypt and Libya only) had a similar musical rather high-pitched tone to that of most small "dove-headed" breeds of domestic pigeons, less deep and gruff in tone than those of larger breeds.

The Rock Pigeon is a bird well worthy of the attentions of the aviculturist. It is hardy, beautiful, and according to both Macgillivray (1837) and Heinroth (1927), hand-reared specimens can be kept in the same manner as domestic pigeons. As one would expect they are, according to Macgillivray, more sensitive than their coarsened domestic descendants, and if kept short of food (and probably also if subjected to any distress such as losing a mate, or being severely frightened) will desert their home and go wild. At one time blue Domestic or Dovecote Pigeons similar to the wild form were plentiful but now, at least in England, such birds seem to be nearly, if not quite, extinct. A few remain in some towns, where the authorities often

" protect " them from anyone who wishes to procure two or three alive for breeding or scientific study, but permit or encourage their slaughter for profit by professional pigeon-killers. A similar outlook unfortunately prevails regarding the wild Rock Pigeon, which is blacklisted in Scotland under the new Bird Protection Act, so that the sportsmen may kill it as much as he likes. Yet when I wished to procure a single pair of squabs for my behaviour observations, some bird-protectionists were " horrified " at my depravity.

All the evidence suggests that in Britain at least, and probably elsewhere, the Rock Pigeon is decreasing. Whether this is due to alteration of climate and biotope (certainly the depopulation of St. Kilda appears to have been the cause for the once numerous Rock Pigeons of that Island becoming extinct), competition with the Stockdove or other birds, interbreeding with Feral Pigeons, or destruction by man is uncertain. Probably more than one factor is at work, and an elucidation of the problem would make an interesting study. The Rock Pigeon's breeding habits certainly make it particularly vulnerable to modern man, since although the nests are often inaccessible, the parents *must* go in and out of the cave, and then sportsmen sitting at the entrance have them at their mercy—or lack of it. Probably the Scottish Rock Pigeons, near the northern limit of the species' range, are more vulnerable to the " extra " predation imposed by man than are their kind elsewhere. Our latest British bird protection Act has, deplorably in my opinion, a special clause to legalize the use of motor boats for Rock Pigeon shooting so that those nesting in otherwise inaccessible sea-caves shall not escape the sportsman. Since this method can, or so it was said during debates on the subject, only be undertaken successfully in summer and late spring, it is evident that many of the birds shot will have young which will be left to starve.

The keeping and breeding of Rock Pigeons of pure strain, not only of the European form, but also other races, would surely be just as interesting as the perpetuation of the many monstrous Domestic Pigeons that in their countless thousands are now eating corn that might be put to better purpose? The danger of degeneration would not be great provided photographs, measurements, and notes on behaviour of the first birds were made in order that any young that did not come up to their parents in form, colour, or behaviour could be eliminated from this breeding stock.

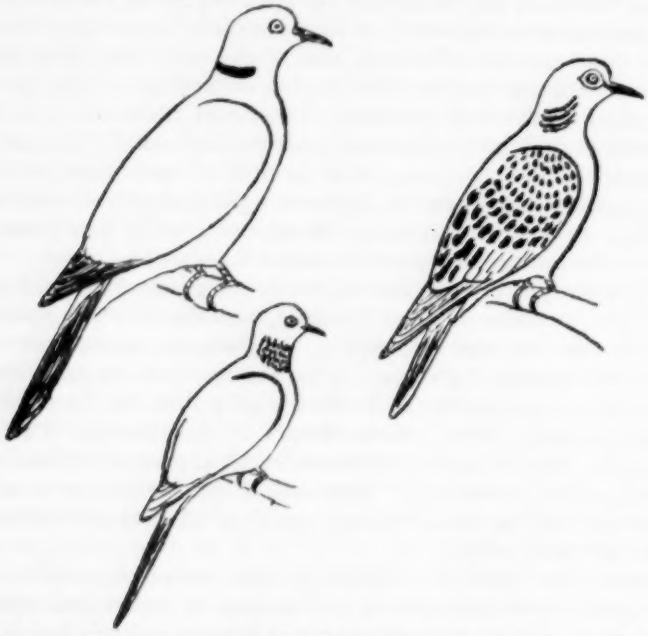
From the point of view of beauty, well, compare the photographs of Rock Pigeons in Heinroth (1926–7) with those of any domestic breed. I will readily concede that some breeds of Domestic Pigeons—such as the Ice, the Gimpel, the Archangel—are creatures of great beauty, but none of them, in my opinion, equal the wild form in this respect.

The Turtledove (*Streptopelia turtur*) is one of the loveliest of its genus. Slightly smaller than the Barbary or Blonde Ringdove (*S. risoria*), and slightly larger (in bulk not in length) than the Mourning Dove (*Zenaidura macroura*) its small size and white-patterned tail at once distinguish it from other British pigeons. Its head is blue-grey, shading to sepia brown on the back, and pale mauve-pink on the breast. The wing-coverts are orange-buff, mottled with black, with some blue-grey on the outer coverts. On each side of the neck there is a patch of black, silver tipped feathers, that are erected in display. The primaries and central tail feathers are dusky. The outer tail feathers are boldly patterned in dark grey and white, as is the underside of the tail. The iris is golden, and the eye is set in an area of bare wine-purple skin. The young are duller, and of a general sepia and greyish with tawny-buff edges to the wing coverts. Many, but not all, hen Turtledoves are somewhat duller and paler in colour than cocks.

The Turtledove is a summer visitor to temperate Europe, breeding commonly in many parts of England, especially in the south-east. It breeds also in northern Africa, the Saharan oases, and east to Persia and western Turkestan. The Persian form is paler and the Saharan forms are sandier and with less grey than the European bird described above. The various forms of the Eastern Turtledove (*S. orientalis*) and the dark turtledoves found in parts of Africa south of the Sahara and in Arabia (*S. lugens* and *S. hypopyrrhus*) are considered by some authorities (*Meinertzhagen*, 1954) as all geographical races of the one species (*S. turtur*).

In Britain the Turtledove likes fairly open woodland, arable country well supplied with thorn scrub, tall hedges, or copses and especially districts at the stage when agriculture is fighting a slowly losing battle with gravel extraction, building, and other forms of human " progress " and woodlands are destroyed and have reburgeoned into scrub. The Turtledove needs ground that is bare or covered only with sparse scattered, or very short vegetation, where it can walk about unhindered in its search for food. This consists principally of seeds, but some greenfood and, probably, some quiescent forms of animal life are also taken. Hence most of its feeding is done in fallow or arable fields, on roadsides, dried-out gravel pits, and similar places. In open woodlands it will feed on the fallen seeds of conifers and perhaps also of the birch, as does the domestic Barbary Dove when at liberty. It often comes into stockyards and poultry runs to search for scattered grain. It breeds in small copses, orchards, patches of scrub, tall hedges, and open woodland. Deep woods are usually shunned, but dense thickets of thorn, hazel, crab-apple, etc., may have a large breeding population. Each nest is then, however, adjacent to an open space or larger tree that gives the parents ready ingress and exit to the thicket. The nest is built in a bush or tree, usually from four to twenty feet above

ground. The type of site chosen is very similar—on a smaller scale—to that described for the Woodpigeon, a horizontal branch of a hawthorn or crab-apple bush being a common site. Two white eggs are laid and hatch in about thirteen days. The young grow even more quickly than most doves, and can fly when fifteen days old.



Collared Dove, Turtle Dove, Laughing Dove. (The Laughing Dove is not quite to scale, it should be a little larger.)

The Turtledove has a distinctive purring coo, a sort of "Coorr-coorr" or "Turr-turr", a rather different version is used when calling on the nest site "Coorr-crr-coorr" and when displaying it utters a hurried emphatic "Crurr(wa), crurr(wa), crurr(wa)" in time with its quick bobbing bows. It has a short, "popping," explosive cry of anger or excitement that corresponds to the laughing cry of the Barbary Dove (see Goodwin, 1952), but is less freely used. In the display flight the bird flies up, claps its wings, and then glides, rather steeply as a rule, down with tail and wings widely spread.

Hand-reared Turtledoves make delightful birds for a large aviary. If carefully managed they stay very tame, and even if allowed to lose their first tameness they do not become distressingly timid. They breed freely, indeed almost too freely as a fine spell in January or February may set them nesting, with resultant egg-binding should the weather turn cold when the hen is about to lay. They should,

therefore, on no account be allowed to nest before April. Hand-reared birds show no distress at not being allowed to migrate, and are extremely hardy, but should not be allowed to roost outside in cold weather. Wild-caught adult birds soon become relatively tame and steady, and would doubtless breed quite freely under suitable conditions. I cannot, however, give any personal observations on this point, as the only wild-caught Turtledoves I have observed were in Malta and Egypt, and kept under conditions where it was most unlikely that they would ever come into breeding condition. The fact that they survived at all speaks volumes for their hardiness. Still, there is something unpleasant about confining a bird that has become accustomed to making a long migration, as every adult Turtledove has. The question is rather academic for British aviculturists, as the Turtledove is now protected here at all seasons, and it is illegal to take either eggs, young, or adults. Whilst no one can cavil at the protection of this harmless and beautiful bird from the kind of exploitation to which it is elsewhere exposed, yet in view of the vast numbers of English-bred Turtledoves that are shot in France, Spain, and Portugal on migration, it is rather vexing that an Englishman interested in keeping and studying pigeons is not allowed even to take a single pair of squabs for observation and study at close quarters.

Unlike the Barbary Dove, the Turtledove has a very strongly developed "homing instinct" and captive birds that escape, even under the most unfavourable circumstances, almost invariably return home within a day or so, except during the migration period. As aviary birds they have one fault. They are very easily alarmed at night, and if roosting in an open aviary they will then flutter madly against the wire, injuring themselves and alarming any other birds. I suppose the fluttering of a bird against wire suggests the wild struggling of a bird seized by a predator, since it seems to act as a "releaser" to induce similar panic in other birds. Even the Barbary Dove, which hardly any amount of other disturbance in the least perturbs, will often dash madly from its roost and batter against the wire if it hears this sound. This has nothing to do with wildness or tameness, the hand-reared Turtledove that flies on to your shoulder and lets itself be handled freely is just as liable to panic at night as a wild and timid one. There is only one possible way of dealing with this, unless, like the proprietors of some Zoological Gardens, you do not mind seeing your Turtledoves with scalped heads half the time. Each evening either lure or drive the birds into a shelter to roost or else pick them up one by one and put them for the night into a pigeon basket or similar receptacle. Beneath a shelter roof they will seldom get alarmed, but if they do then the pigeon basket must be used for them. Turtledoves very soon get used to this procedure—tame ones may be

lifted on the finger to avoid handling them, which soils their plumage—and will breed and behave quite normally when it is carried out. They must of course be liberated at dawn or near it, not left in the basket for hours after daylight.

The Collared Dove or Indian Ringdove (*Streptopelia decaocto*) has of recent years caused great excitement in the ornithological world by its rapid extension of range (see Fisher, 1953). It is now a common bird in many parts of Germany and Holland, and has occurred once in Britain, though this bird may have been an escape. In size it is a little larger than the domestic Barbary Dove, and has a proportionately longer tail than most specimens of the latter. Its colour is a general pale greyish fawn (not creamy-buff as in the domestic bird), with blackish primaries and a mauve-pink tinge on head and breast. It has the same red eyes and black, silver-edged half collar as the Barbary Dove. The young are duller, with light edgings to the covert feathers, and have only an obscure dark marking on the sides of the neck. It has a wide distribution throughout much of Asia, the Burmese form (see Newman, 1906) being darker and with conspicuous yellow skin around the eye. The Rose-grey Dove (*S. roseogrisea*) which I have discussed before (Goodwin, 1952) in reference to its almost certainly being the ancestor of the Barbary Dove is considered by many to be conspecific with *S. decaocto*. With this opinion I am inclined to agree, since (see Hofstetter, 1954), the behaviour of the Collared Dove and the Barbary Dove are virtually identical, in spite of the difference in sound of their calls. Anyone visiting the London Zoo where both Collared Doves and Barbary Doves are confined in the same aviary cannot, I think, help coming to the conclusion that they are watching birds of the same species. Taibel (1953), considers *S. decaocto* and *S. roseogrisea* to be distinct species, chiefly because of their difference in voice. The difference in tail markings (see Hartert, 1916) between *S. roseogrisea* and *S. decaocto* is not constant. I have seen a skin of *S. roseogrisea* in which the tail marking is as in the larger bird.

In Europe the Collared Dove is very definitely a symbiote, or parasite, of man. It frequents gardens, park and scrubland, and towns, and subsists very largely on grain fed to poultry and other livestock. Its tameness tends to disarm human annoyance, and so its " pilferings " do not meet with the same disfavour as those of other pigeons. This immunity from harm by man and his supplying it with food probably account for the bird's phenomenal success and rapid increase. Possibly also the recent large-scale killing of sparrows in Germany has helped it in that country by relieving it of competition for man's bounty. In addition to grain, it also takes elderberries, seeds of various weeds, and some greenstuffs. Probably also some forms of invertebrate life, though these have not been recorded. It nests usually in trees, but

sometimes on ledges in buildings, and may have as many as five broods in succession (Hofstetter, 1954) between March and October. The territorial " song " of the Collared Dove is a loud " Koo-kooo-kook " with the middle syllable stressed. Similar cooing, but with the accent no longer on the middle syllable, is given when displaying and when calling to nest (see Hofstetter, 1954). A peculiar nasal cry, difficult to put into human words (and variously done so by most who have tried), is uttered under the same circumstances as the laughing cry of the domestic form. The display flight is very similar to that of the Turtledove.

The Collared Dove is easy to keep in captivity, and goes to nest freely, even when freshly caught (Grunefeld, 1952). Where it is common there would be little point in keeping it, as it is so tame that it can be freely observed in a wild state. From its habits it is almost certain that captive birds could be easily kept at semi-liberty, but in view of the interest attaching to its natural spreading in Europe, it is of utmost importance that anyone keeping this species should ring *all* their birds.

The Laughing Dove or Palm Dove (*Streptopelia senegalensis*) should not strictly speaking be included in this article, as it does not occur naturally in Europe. It has, however, been introduced into Malta (Goodwin, 1948*b*) and perhaps elsewhere, and this and the fact that it is commonly imported in a captive state is my excuse for mentioning it. It is somewhat smaller than a Turtledove, with proportionately shorter wings and longer tail. Its general plumage is warm reddish-brown, with some slate-blue on wings, rump, and tail. The head and breast are reddish-vinous, except for a patch of bifurcated feathers on front and sides of neck that are blackish with golden-coppery tips. These form a bright spotted area when the bird inflates its neck in display. Its tail pattern is similar to (but not identical with) that of the Turtledove. There is some racial difference in size and colour. The Egyptian form is larger and very deep reddish (in the male), the Indian (" Little Brown Dove ") is greyish-brown rather than reddish-brown on back and wing-coverts. In Egypt most females are noticeably duller and paler in the reddish-brown parts than are males, but examination of skins suggests that this dimorphism of the sexes is less in other parts of its range. The young are duller, with rufous edgings to the wing-coverts, and lack the bifurcated neck feathers.

This bird is found widely throughout Africa, India, and the Middle East, possibly owing its presence in some places—such as Beirut and Istanbul, to human introduction. It is generally very much a town or village bird, showing little fear of people, and nesting on ledges and rafters in buildings as well as in trees and shrubs. It feeds on the ground, principally on seeds, although it probably takes some forms of inactive animal life also. It has a pleasant laughter-like cooing,

soft and gentle in tone. Some birds caught wild in Egypt (Goodwin, 1947) bred at once in captivity, and it is well known to breed freely in aviaries in Britain. It is said to stay well when given its liberty, and no doubt does so until a Tawny Owl finds its roosting place. Anybody thinking of trying this bird at liberty would, I imagine, be well advised to catch it up as soon as the leaves fall, and confine it for the winter.

Whilst Laughing Doves are just as easy to hand-rear as any others, and such hand-reared birds are in every way preferable, still the objections to using wild-caught specimens are much less with this than with most other species. Naturally inclined to be "tame" they soon become more so, and if properly looked after will at once settle down in captivity.

Tail Patterns and Display Flights

The markings on the tails of pigeons are worth considering in some detail, but here I will confine myself to the species dealt with in this article. The Rock Pigeon's tail is bluish-grey with a broad but ill-defined black terminal band. The narrow outer webbing of the two outermost tail feathers is white for the basal two-thirds (approximately) of their length. The underside of the tail is darker, with the markings indistinct or virtually absent. The Stockdove's tail is very similar, but shows an ill-defined narrow bar of slightly paler grey across the middle. This is almost, if not quite, equally evident on the underside of the tail, and in life is actually more noticeable from below if—as is commonly the case—the flying bird is seen against the light.

Under tail patterns of Turtle Dove, Collared Dove, Woodpigeon. (These are not to scale.)

In the Woodpigeon's tail we find the light grey central band well developed on the upper side of the tail (except on the two central feathers) and conspicuous when the bird spreads its tail in flight. The underside of the tail however, is even more clearly marked in very pale and very dark grey, and is most conspicuous when the bird is viewed from below.

The three *Streptopelia* species have the uppersides of most of their tail feathers (the central ones, which alone are visible from above

when the bird is at rest or feeding with folded tail, are dull and cryptic), patterned in dark grey and white, or whitish-grey. All have the undersides of their tails boldly patterned in black and white (see sketch).

These differences are almost certainly connected with behaviour patterns, and are not merely the fortuitous by-products of physiological processes. The four species with a conspicuous pattern on the underside of the tail all have a display flight in which the bird (normally) first flies *upwards*, then glides or floats forwards and downwards. The initial towering is probably referable to the necessity to rise clear of the surrounding tree tops. At the same time in this sort of flight display other birds perched near by will see the displaying bird from beneath, whence the markings on the underside of the tail will be most conspicuous.

The Rock Pigeon, in its display flight, flies straight out from the cliff or building, inclining its flight horizontally or even slightly downwards. (Domestic Pigeons starting from the ground or a pigeon-house roof must often fly upwards to clear immediately surrounding obstacles, but otherwise they do not do so.) Other Rock Pigeons near by are therefore likely to see the displaying bird from above or on a level rather than from below. The above instances suggest that conspicuous markings on the *underside* of the tail have probably evolved in correlation with a display flight in which the bird is usually seen from below by other members of the species. The white markings on the upper side of the tail feathers of doves of the genus *Streptopelia* probably function as a social signal eliciting a following reaction (? especially in the young) when a bird flies up or alights. They are not, however, exhibited in the bowing display, as are the very similarly marked tail feathers of the doves of the genus *Geopelia* and the Wonga-wonga Pigeon (*Leucosarcia melanoleuca*).

The Stockdove occupies a rather intermediate position in this respect. The display flight is very similar to the Rock Pigeon's, but the bird's tail markings—such as they are—are as pronounced on the underside of the tail. It is possible that the Stockdove's display flight, taking place as it commonly does among or near trees, is most often seen from below by others perched among the branches. One might surmise that the Stockdove's tail markings are at a half-way stage, and in the course of evolution may—in the event of Man not destroying the world and all its bird-life beforehand—either develop further or be completely lost. On the other hand it may well be that the rather indistinct tail barring of this species is of purely physiological significance. A possibility to which the occurrence of very similar tails in some other *Columba* species may add weight. The barring of the upperside of the tail of both this species and the Wood-pigeon may be referable to the bowing display, when the tail is opened

as it is raised. Though I doubt if it is at most more than of minor importance in this display.

It would be most interesting in this connection to have an accurate description of the display flight of as many species of pigeons as possible. Perhaps some of our American readers could tell us if the Band-tailed Pigeon (*Columba fasciata*) and the Mourning Dove (*Zenaidura macroura*) with their striking tail patterns, differ in the form of their display flights from the Red-billed and White-crowned Pigeons (*Columba flavirostris* and *C. leucocephala*) with their unmarked tails?

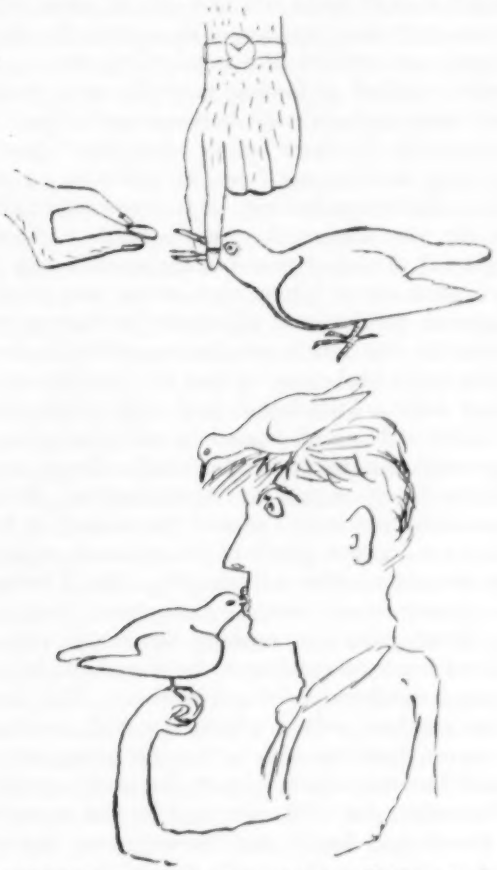
Hand-rearing, imprinting, settling, etc.

No birds are less trouble to hand-rear than young pigeons. In most species a morning and evening feed are quite sufficient owing to their large crop capacity. If it is desired to have the birds really tame it is best to take them as soon as the feathers of back and wings are just breaking from their sheaths. If they are left till well-fledged—at any rate in the case of the Woodpigeon and Stockdove—they nearly always become wild and afraid of their keeper as soon as they can feed themselves. This may not apply to the Laughing Dove, Collared Dove, and Turtledove, of which I have never hand-reared late-taken fledglings. It would be interesting to know if the young of the tame London Woodpigeons would behave differently in this respect from their country-bred relatives. The latter, if taken when well fledged, or even if caught after leaving the nest (but before beginning to feed themselves) soon co-operate in artificial feeding, but in my experience become timid on reaching independence if taken after about the tenth or twelfth day. Colquhoun (1951) working with larger numbers found the same.

Young pigeons taken prior to fledging may miss parental brooding at first. One should not therefore try to " copy Nature " by dumping them on a platform of twigs, but construct a snug artificial nest for them. If they show signs of discomfort through cold covering them with a loose cloth or putting beside them a slightly older young Domestic Pigeon may be resorted to. Once they are well feathered a pigeon-basket with a thick layer of peat moss or similar material on the floor is ideal. They can see through the slats, and thus get used to strange sights and people if the basket is often moved about. They should also be handled, and carried about on the hand, as much as possible. The more this is done at an early age, the less nervous of strangers and novel scenes will they be in after life.

Some people find it difficult to feed young pigeons, but nothing is more easy. Wait till the young bird's crop is empty (but do not let a young pigeon remain any length of time in this condition) before starting, as if it is hungry it will be more co-operative. Grasp the

base of its bill gently between thumb and forefinger of one hand. With the other gently prise open the mandibles and put some food into the mouth. The bird will swallow it eagerly, and when this has been repeated a few times it will gape open its bill as soon as it feels the



Two methods of feeding young Pigeons. (*a*) the efficient, (*b*) the spectacular.

pressure of thumb and finger on either side. It seems to aid peristalsis if during feeding one " pumps " the young bird's head, by means of the hand holding its bill-base, up and down in a similar manner to the head of the feeding parent. Either because the hand-feeding does not supply quite the right stimuli or because it is less comfortable than the natural way pigeons being so fed will often cease to gape before their crops are much more than half full. If this happens with small young that are going to be left some time before the next feed, one should continue to feed as long as the young swallow readily when

food is put in their mouths. One will of course be easily able to avoid over-filling the crop, presuming one has some experience of naturally reared pigeons. After feeding give the bird a drink, and some five minutes later let it drink again if it will. To do this, hold its bill as described, and insert it into a cup of warm water (or other liquid). As soon as it feels liquid over its nostrils the squab will drink eagerly if thirsty, and withdraw its head if it is not.

An alternative method of feeding is to fill one's mouth with food and insert the young pigeon's bill between one's lips. This method is very spectacular in the later stages when the "dear pretty birds trying to kiss their kind master" can be relied on to send a certain type of bird-lover fairly into ecstasy. It is, however, in my opinion less efficient than the way suggested. One is liable to finish with one's own oesophagus full of soaked peas and the squab's crop full of human saliva. Still, I must admit I have met one or two people who could feed young pigeons quickly and efficiently by way of mouth.

All the species in this article can be reared on soaked wheat and maple peas (the latter broken up at first for Turtledoves or Laughing Doves) together with a little bread and milk (wholemeal bread cut into suitable sized cubes and dipped in milk just prior to feeding), cooked egg, peanuts (broken up for the smaller doves), and greenfood, not much of the latter except for Woodpigeons. Being now very vitamin and mineral conscious, I should give a drop or two of halibut oil every week or so, and a pinch of the minerals sold for Domestic Pigeons every few days. Also a little grit. But I have in the past reared them without these extras. Colquhoun (1951) successfully reared young Woodpigeons on nothing but maple peas and a little milk, and I have known a Stockdove to be reared and kept for eighteen months (but *then* it died) on nothing but wheat. This latter bird was, however, in an outdoor aviary where it could no doubt get some minerals and so on, from the soil. Once the young are about three weeks old it will be unnecessary to soak the grain, and one can then fill one's half-clenched fist with corn and let the squeaker thrust its bill between thumb and finger, and literally pour the grain into its mouth.

When the young start to feed themselves (for methods of retarding or hastening this, see my previous paper), it is advisable to get them accustomed to a wide range of foods. This will obviate difficulties later should some grains become unobtainable. It is a very good idea to start them feeding on soft food, large seeds such as peas and peanuts, and so on. If they start thus it will be quite easy to get them to take smaller seeds later, but the converse is not always true. If they are taught to eat a wide range of foods it will also increase their chances of survival should they escape and fly away, or have to be cast adrift owing to war breaking out.

Domestic Pigeons will hatch and rear the young of wild species of about the same size, for the smaller Turtle and Laughing Doves the domestic Barbary Dove is better, though many Domestic Pigeons will rear such small young. It is necessary that the eggs or young exchanged are about the same age, as if the young hatch too soon they will die of malnutrition if the fosterers have no pigeon's milk for them. Young that have begun to feather may not be readily accepted, though some cock Domestic Pigeons will feed any young pigeon, be it black, white, or piebald, so long as they are in the parental phase of breeding cycle.

There are two disadvantages in rearing wild pigeons by this seemingly easy manner. Firstly the young seldom show any tameness, but in spite of their foster parents' example, become wilder and wilder, and finally fly away to return no more. At least this has been the case with three nest-pairs of Woodpigeons and one of Stockdoves that I have known to be reared by this method. Perhaps had the young been handled, fed, and carried about for an hour or so each day by their owner, things would have been otherwise. At least a young Speckled Pigeon (*Columba g. guinea* × *C. g. phaenota*) which is now (3rd February, 1955) 7 weeks old, seems to have been successfully tamed by this method, despite the wildness of its parents.

The second danger is that the young birds may grow up completely fixated on the foster species, so that they will not in adult life react sexually to their own kind. Such birds are of course useless for breeding, unless one wishes to produce hybrids with the Domestic Pigeon. This " imprinting " may occur even if the young are hand-reared in association with Domestic Pigeons (or any other species), and in company of another of their own kind, as happened with a cock Woodpigeon I once had (Goodwin, 1948*a*). Such birds are of course likely to be good " stayers " provided Domestic Pigeons are kept. But to provide them with a mate would probably necessitate imprinting a Domestic Pigeon of the opposite sex on their species. Most often, however, young brought up with both their own and another species as companions (having been fed first by their *own* parents and then by man) will later react socially to both species, and often to humans as well. They will generally pair most readily with their own kind, owing to mutual " understanding " of the specific notes and displays. Thus they are quite valid for breeding purposes or behaviour studies, and a positive reaction to Domestic Pigeons or Barbary Doves (supposing one of these to be the other species they are reacting to) is an advantage if they escape, or are to be kept at liberty. In fact the only wild pigeons I have so far kept at liberty were showing positive social responses to my Domestic Pigeons. It would, I think, be much harder to " settle " such as were not, especially if their own species were common locally.

If any attempt is going to be made to fly them at liberty in later

life, it is a great advantage to make the young pigeons familiar with the neighbourhood of their home at an early age by carrying them about on the hand before they can fly. Young birds are more likely to stray than old ones, but they seldom go for good on their first outing, so that it is a very good idea to let them out a few times at an early age. This will obviate the likelihood of their flying so far off when first liberated that they are unable to find their way back. After the first few flights it would probably be expedient to keep the bird confined until it has matured and paired. Much will depend on local circumstances and the individual bird, and the owner should be best able to judge when the time is ripe to liberate it. A few very general suggestions may be given, however, as follows.

(1) The bird should have been able to see all around outside its enclosure for at least a week prior to liberation.

(2) If it is reacting socially to Domestic Pigeons or Barbary Doves the owner should have some of these at liberty and accustomed to feed near the aviary to which (it is hoped) the wild pigeon will return.

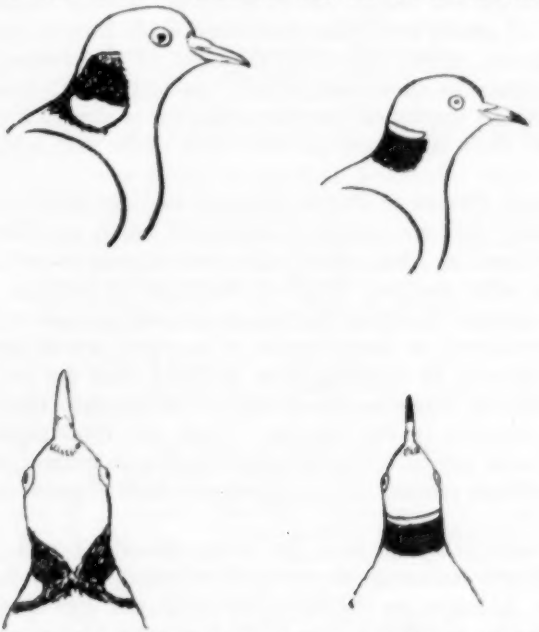
(3) Failing the above, or additionally thereto some of the bird's own species should be in a near-by enclosure and readily visible.

(4) The bird should have been trained to respond to a particular call or whistle for food, and if possible to go *voluntarily* into a shelter to roost. This last because birds accustomed to do this—even when of species like the Woodpigeon and Domestic Fowl that would otherwise go into a tree—will usually try to come into a building or under a roof to sleep, which greatly adds both to their safety and their owner's control over them.

Even if the above council of perfection can be complied with, one will still have losses. Birds at liberty meet violent ends, and sooner or later the sportsman's gun, some predatory bird or mammal, or some vexatious accident will write " finis " to the creature that has given you such interest and enjoyment. But provided one takes all possible precautions *and the bird is fit*, one should not feel any moral qualms against liberating it to a fuller if more hazardous existence. The above remark does not of course apply to such species of exotic pigeons—or any other birds—as would be quite unable to survive if lost for only a few days in our climate and environment. It goes without saying that anyone who values their birds at all will ring them with name and address rings whether they intend to liberate them or not. Such rings cost less than a shilling each, and often prove of utmost help, as with a Barbary Dove of mine which flew to Ireland and was subsequently returned safe and sound. There may be reasons why one hesitates to label as one's own a tame Raven, Eagle, or other creature liable to pull off one's neighbour's ear or eat his baby, but there can be no possible reason, other than slackness and incompetence, for not so ringing pigeons.

Comparison of European and North American Species

North America has more species of wild pigeons than Europe. Of these, however, many are found only in some of the southernmost states of the U.S.A., and are primarily Mexican and Central American species. I propose here to mention only the species that are (were, in one case) found more widely in the United States and in those areas that are to some extent comparable to Europe in climate and vegetation. These are the Band-tailed Pigeon (*Columba fasciata*), the



Heads and display plumage of Wood Pigeon and Band-tailed Pigeon.

Passenger Pigeon (*Ectopistes migratorius*), and the Mourning Dove (*Zenaidura macroura*).

The Band-tailed Pigeon of western North America shows some resemblance to our Woodpigeon. When living birds, or even museum skins, are compared, however, it will be seen that the two are much less alike than some coloured plates make them appear. The Band-tail is smaller, its grey and mauve-pink colours are darker and different in tone, its yellow legs and black and yellow bill are strikingly unlike the greyish-mauve legs and yellow-orange bill of the Woodpigeon. The white and green display markings on the neck are differently arranged (see sketch) and the glossy green feathers differ in both structure and colour. The Band-tail is certainly more closely related to most, perhaps, all of the South and Central American species of

Columba (a genus composed of a rather heterogeneous collection of large or medium-sized pigeons with more or less square-ended tails) than to any old-world species.

In its feeding habits the Band-tail appears to be very close to the Woodpigeon, and therefore shows, as would be expected, a similar ability to cling and clamber in the branches. It seems to have been less successful at adapting itself to co-existence with modern man, no doubt because human civilization has burgeoned more rapidly in the new than in the old world. It is, however, already learning to take advantage of man's activities, and often feeds largely on cultivated grains (Glover, 1953). A detailed study of the innate behaviour patterns—especially those not directly connected with food-getting—of the American species of *Columba* would be of utmost importance in reference to their relationships with each other and with old-world species.

The extinct Passenger Pigeon appears to have filled the " Woodpigeon niche ", or its equivalent, in eastern north America, although it had developed its adaptation to its environment on rather different lines to any other species. Chief of these was its extreme gregariousness which enabled it, when nesting, to succeed, in spite of furred and feathered predators, by sheer weight of numbers (see Scherger, 1955), but which proved its undoing once civilized man got to work on it. It ill-becomes us, however, to adopt a " holier than thou " attitude towards Americans in this matter. That our Woodpigeon has not shared the same fate as *Ectopistes* is due to its own greater adaptability and more solitary nesting habits, not to any lack of greed or cruelty in ourselves.

The Mourning Dove, now the most abundant and widespread pigeon in North America, seems to fill a rather similar niche to our Turtledove. The two are probably, however, not very closely related. Like the Turtle- and Stockdove in Europe, the Mourning Dove has almost certainly benefited from agricultural man's activities. Possibly also the elimination of the Passenger Pigeon enabled it to widen its niche a little.

One other point of interest may be mentioned. Whereas all the European species of pigeons lay two eggs, the larger North American species lay only one. This suggests either their fairly recent derivation from tropical forms—for many tropical pigeons lay only one egg—or a poorer food supply. The fact that most frugiverous pigeons lay only one egg suggests that a fruit diet might not enable the parents to produce crop-milk sufficient for a brood of two. On the other hand, the Passenger Pigeon with its relatively rich diet of beechmast, worms, and so on, laid only one egg. Here, however, it might have been biologically advantageous to have one young one fledge as quickly as possible, rather than two taking even a little longer, in view of the

heavy demand the breeding colony made on neighbouring food resources.

It is of interest that no cliff or cave-dwelling pigeon inhabited America prior to the introduction of domestic forms of the Rock Pigeon. These latter have now filled this niche in some places, although as a rule they have taken up the role of " town pigeon " rather than that of truly wild birds.

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* * *

BREEDING OF THE RED-TAILED BLACK COCKATOO

(*Calyptorhynchus banksi*)

By KENTON C. LINT (Curator of Birds, Zoological Gardens of San Diego, California, U.S.A.)

The first successful breeding in captivity of this species in the United States was achieved last year in the Zoological Gardens in San Diego, when a baby was hatched on the 22nd November, 1954.

The single white egg was laid 25th October, 1954. We recorded an incubation period of twenty-nine days.

The Red-tailed Black Cockatoo is also known as the Banksian Cockatoo because of its fondness for banksia scrublands. At one time these magnificent Cockatoos were found throughout Australia with the exception of Cape York, and were plentiful even quite close to the great city of Sydney.

Unfortunately they are fast disappearing due to the lumbering off of the forests of eucalyptus, *Casuarina*, and banksia, the seeds of which form their staple food, and to the fact that thousands have been shot to be eaten as food.

The Zoological Gardens of San Diego first acquired this species on 21st June, 1950, through the kindness and generosity of Sir Edward Hallstrom, Sydney, Australia, who was willing to send us birds raised in his private aviaries, and who believed we would be able to propagate this rare species in captivity in the United States.

Red-tailed Black Cockatoos assume their adult plumage in the fourth year and are very long lived.

In Arthur A. Prestwich's *Records of Parrots Bred in Captivity*, Part II, 1951, p. 33, the late Marquess of Tavistock is given the credit for the first breeding of this species. " Mr. Gorman, who had charge of the famous collection of Parrots and Parrot-like birds belonging to the Marquess of Tavistock was forced to remove the baby from its nest and hand-rear it " (A.M., 1940, 136). Alan Lendon (A.M., 1943, 164, describing a visit to Hallstrom, Sydney, Australia, says : " Successfully bred by E. Hallstrom in 1943." And Hallstrom, *in litt.*, 8th December, 1948, writes : " I am breeding regularly Black Cockatoos (Banksian) " (recorded in A.M., 1949, 31). Alan Lendon (*Parrot Records, Adelaide Zoo Gardens*) records that two young ones were successfully reared in the Adelaide Zoological Gardens in 1945.

The Red-tailed Black Cockatoo is one of the most interesting of all Australian species of birds. The general colour above and below is black with a greenish gloss. Many of the feathers have a wavy appearance. The tail, with the exception of the two central feathers, is crossed by a broad crimson belt or band. The bill is slate-grey in colour. The

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[San Diego Zoo

BABY RED-TAILED BLACK COCKATOO.
Age 28 days. 20th December, 1954.

To face p. 86]

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ADULT MALE RED-TAILED BLACK COCKATOO.

To face p. 87]

legs and feet are mealy-black. The eyes are dark brownish-black in the adult male.

The adult female differs greatly from the male in coloration. The general colour above and below is black tinged with brown. The back, scapulars, primary feathers, secondary feathers, and central tail feathers are black. The second, third, fourth, and fifth primaries incised on the outer webs and the first to the fourth on the inner webs ; upper wing-coverts and bastard wing black fringed with pale brown and with whitish markings to the feather ; outer tail-feathers barred and mottled with yellow and red on the middle portion of the feathers, the bars becoming narrower towards the tips, the under surface of the tail is much duller in coloration than on the upper parts. The crown of the head, occipital crest, and sides of face are black with pale yellow subapical markings to the feather. The breast and abdomen are brownish-black, the feathers on the former barred with dull yellow, and those on the latter with a mixture of yellow and red. The under tail-coverts are black and barred similarly to the abdomen. The bill is whitish-grey with a greyish-brown tip. The legs and feet are mealy-black. The iris is brown, the orbits are black.

In Central Australia this Cockatoo is often associated with aboriginal rain ceremonies. The beautiful tail feathers banded with vermilion are used for decorating ceremonial objects and are also worn as head ornaments in corroborees.

While these birds do a certain amount of damage to the trees among which they feed they are of inestimable value in destroying the larvae of the longicorn beetle which are so harmful to Australian timber.

In captivity we have found the most suitable food for the Red-tailed Black Cockatoo to consist of Indian corn (on the cob), sunflower seed, oat groats, wheat, peanuts, pine nuts, apple, lettuce (by the head), and dried bread. During the breeding season only cuttlefish bone is added to supplement this daily diet.

There are many aspects on which the field ornithologist and the practical aviculturists do not see eye to eye, but it must be granted that, housed and cared for under good conditions, birds can provide much of interest and enable the garnering of detailed data not possible with birds in the bush.

Unless aviculturists solve the problem of propagating this particular species in confinement it probably will not be long before the Red-tailed Black Cockatoo will be added to the long list of beautiful and desirable birds which have vanished from the face of the earth.

* * *

RED-CRESTED CARDINALS

(*Paroaria cucullata*)

By D. H. S. Risdon (Dudley, Worcs., England)

The beginner in foreign bird keeping who wants some showy, hardy birds could not do better than invest in a pair of Red-crested Cardinals. They have much to recommend them, being as hard as nails, beautifully coloured, reasonably priced, and easy to feed and manage. The only snag about them is that they are not easy to breed, requiring unlimited supplies of live insects when rearing young.

I think a Red-crested Cardinal could be described as being somewhat smaller than a Starling and slimmer in shape. It is blue-grey above, snow-white below, with a bright red head and crest.

One of the things I like about this bird is its bold swaggering demeanour. It is very active and somewhat restless in a cage, although it will do perfectly well when kept under such conditions, provided the cage is not less than, say, 3 feet long, to give it plenty of room to take exercise. However, the Red-crested Cardinal looks its best in an outdoor aviary, and when this is large enough for it to find a certain amount of insect life it will be found that its head and crest maintain a much brighter red than when it is kept indoors.

These Cardinals are difficult to sex, both cocks and hens having exactly the same colouring and markings. If you are at all observant, however, you can after a while pick out a true pair. If you watch your birds carefully when they are not on the alert, it will be found that a cock keeps his crest lowered and only puts it up when excited, while a hen seems to keep her crest more or less permanently erect. This is not an infallible guide, but in practice I have found it a very good indication as to sex. You need several birds together to be able to make the comparison. Unless, however, you are intent on trying to breed Red-crested Cardinals, it does not really matter whether you have a true pair or two of the same sex, as either way they seem to agree quite well.

Personally I have never heard a Red-crested Cardinal sing in a cage, but in a garden aviary it does so quite well, the song having some pleasant mellow notes reminiscent of that of a Song Thrush.

These birds have a reputation for being destructive to growing vegetation, but in an aviary of sufficient size their depredations will not be noticeable. In any case, I think it a mistake to try and plant *small* aviaries as the bushes quickly get soiled and nibbled by almost any birds.

A good seed mixture for Red-crested Cardinals is three parts canary to one part white millet, with just a trace of sunflower and hemp ; but do not overdo the latter if the birds are kept in cages, as it is too

fattening for them. It will be found in practice that they eat far more canary than millet. Greenfood is eaten in moderation, such as lettuce, dandelion, and chickweed, and seeding grasses are liked, and I have found that in a mixed aviary along with fruit-eating birds they will sample orange and apple as well. Although Cardinals will live for years on a diet of seed and greenfood alone, I am quite sure that live insects are good for their health, and they most certainly improve their colour. If your birds are kept outside in a fair-sized aviary they will probably find all they need for themselves, but kept indoors they should have a regular supply of maggots, mealworms, or any other insects you can find for them. Maggots can be given *ad lib*, but mealworms should be strictly rationed, as the birds like them so much that they tend to over-indulge in them with disastrous results to their livers. Two or three mealworms per bird per day are quite sufficient. Out of doors in an aviary, of course, they can eat many things which would be detrimental to them in a cage, and where kept in a mixed collection will eat all sorts of other foods offered to different species, without apparent harm.

Red-crested Cardinals can be spiteful towards birds smaller than themselves, especially when they come into breeding condition, but here again much depends on the size of aviary in which you are keeping them. In the ordinary small enclosure it is most unsafe to risk them with birds the size of Waxbills or Mannikins, but in large enclosures the risk is not so great as the other birds can get away from them.

As I have stated above, Red-crested Cardinals are not easy to breed, although there are a number of records. A friend of mine told me quite recently that he bred a lot of young Cardinals one year, but that most of the young birds died off before they started the autumn moult. In a wild state they build an open cup-shaped nest in a bush, so if you wish to try and breed Cardinals similar conditions should be afforded them in an aviary by fixing up clumps of bushy twigs in secluded corners as well as a few nest boxes open at the front except the bottom third, which should be boarded in to retain the nesting material. Such boxes should be well screened with bushy twigs to give seclusion. You will probably find that your pair of Cardinals will go to nest readily enough, and even lay and sit, but rearing the young is another matter, unless you can provide plenty of live insects. Like so many so-called seed-eaters, Cardinals become almost entirely insectivorous when they have a brood of young to rear. At such times it will be advisable to keep a pot of well-cleaned gentles in their aviary, and give a feed of mealworms several times a day, not to mention any other insects you can find in the garden.

Although I have never tried it, I should think that a pair of these birds would make excellent liberty subjects whilst they had a nest,

provided you have no trigger-happy neighbours with guns and your district is not unduly infested with cats. The technique is to allow the birds loose when young hatch, and to confine them again to the aviary when they are due to fledge, otherwise you are liable to lose the whole family. In this way you will save yourself a great deal of time and work, as the birds find their own live food and, incidentally, will probably rear far healthier young.

A pair of Red-crested Cardinals in my garden aviary last spring had nearly completed a very nice nest in a privet bush when one of them was picked up dead one morning, and that was that. The nest was made of fine twigs and lined with dry grass roots.

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SOME VERY MISCELLANEOUS WINTER NOTES

By The Rev. J. R. Lowe (Coln St. Aldwyns, Glos., England)

Early last May a very rough but healthy specimen of *Siphia strophiata* (the Orange Georgetted Flycatcher) arrived at this vicarage. He had no tail, very few flight feathers, many body feathers missing, but a most lovely orange-crimson spot under his chin, and a prominent white eye stripe. His head and back were gun-metal grey, upper breast black, lower breast and belly dirty white, legs and beak greyish-brown colour. That was all that there was to see in May.

After two days in a cage to recover from the journey he was put into a small garden aviary with a good deal of cover and allowed to vegetate for the summer. The whole demeanour of this bird is robin-like ; about the size of a stoutish Robin, it has the same bold dark eye, the flick of the Robin's tail, and that bird's endearing friendliness.

Through the summer the Orange Throat did well, and on enriched softbill mixture, gentles, and a lot of natural food produced a wonderful moult, so that by September quite a transformation had occurred. The tail had the two centre feathers longest, and these from above were gun-metal grey, the rest of the tail made up of feathers with a white tip, then a portion of black, and the rest of the feathers white. The tail when opened in excitement or anger shows up the black and white, and is slightly fan-shaped. The upper black breast was now liberally frosted, this being true also of the orange spot, the bird looking highly polished all over. He is a great one for baths, and loves a spray each day when he is indoors.

So far the song has been little but good, a very sweet, silvery warble, reminiscent of Tickle's Blue Flycatcher, sometimes a few guttural interjections.

Skinner's *Indian Birds* says this bird is seen in Sikkim, 9,000 to 10,000 ft. He seems quite happy now in a temperature of 56° to 60°, will always take a mealworm before a gentle, and throws a regular pellet.

Towards the end of October two Wedge-tailed Drongos arrived. These birds, though I would not like them to know I'm writing this, are not very exciting. They have moulted quite nicely—they had broken their tails when they arrived, so every bit of tail was removed—and now the long wedge-shaped tail looks very smart. They are jet black, with a little frosting on lower breast, small black feet and short legs, strong black beak, with whiskers, whole plumage takes quite a gloss. General behaviour rather shrike-like. One is a bit larger than the other and so I hope a pair, but at times they are not very kind to one another, and at times the shrieks of protest proceeding from that indoor aviary makes one wonder if Mr. Drongo is a thoroughly nice man. I shall be glad to get them into a garden aviary, where they will look more attractive and get more live food, of which they are inordinately fond. These birds are about the size of a small, rather thin cock Blackbird. Flight rather moth-like. I often think the behaviour of Drongos, Rollers, and Shrikes has much in common. These two birds will have to live with Turtle Doves and Golden Pheasants in the spring.

A Blackbird baby rescued from some very young children in May has given us very nearly his full spring song all day and every day since mid-December. He lives in the birdroom, and the temperature seldom goes below 50°, and his diet is generous. This must be inherited song, as I doubt if he has heard any wild performances at all. Three or four very fine cocks in the garden, while doing a little display to some quite interested ladies, have not opened their beaks yet, though as the year closes it is mild and damp here. Why does my bird sing his head off now, and up to 10 p.m. with his light on? This is a very deep mellow toned bird.

They vary so, one we had from a baby, never learnt his own lovely song, but only a rather vulgar whistle, which I am told is the mating call of some subspecies of the human race. This bird spent a whole summer in a garden aviary, and caused some consternation, as it did not seem appropriate that this G.I. whistle should sound eternally from the vicarage garden. How lucky we are to have this Blackbird song through the dark days of winter, and how little we thought on that May morning when we added yet another responsibility to many others, that we should be so richly repaid.

In the winter we keep the doves in an attic, six Barbarys, two albinos, two Turtles (1954), one cock Necklace. Eventually everybody will be married off to unlikely partners, the two albinos to the cock Necklace and cock Turtle, the lady Turtle to a Barbary swain, and the others

will breed at large. Our visitors have been slightly shaken by Barbary cocks cooing at all hours of the night. The consensus of opinion at first was that it was owls.

The cock Turtle, having been reared by Barbarys, two months after leaving the nest displayed slightly to a hen Barbary, but did not coo. The cock Necklace, though shy with humans, manages all the other doves.

On 2nd September a young Bullfinch, with no visible means of support and barely out of its pram, was picked up in the drive. The vicarage high chair had been out of commission for some ten years, but the baby was successfully reared and to-day, 29th December, the house revolves round Bullie. No attempt has been made so far to change into adult plumage, whether from financial reasons or sheer ignorance we don't know, but it is difficult to have a Christening if you don't know the sex of the baby. It spends a great deal of time sitting on us all, and still sways with its mouth open when spoken to. It loves sitting with a talking Budgie in his cage, but the Budgie is never allowed in Bullie's cage, which is really not fair.

Two Tree Sparrows were hand reared in August. While being hand reared they became delightfully tame, but after becoming self-supporting, became wild as hawks, and were turned into an aviary. The cock is now looking very smart and the hen is a slightly paler edition of her brother. They sleep in a nest-box every night ; it is hoped they will breed in control.

* * *

COUNCIL MEETING

A Council Meeting was held on 9th March, 1955, in the Council Room, Zoological Society of London.

There were the following appointments :—

Elected Hon. Fellow : Professor Alessandro Ghigi.
Elected Hon. Life Member : Mr. J. Bailey, Mr. S. Williams.

The Society's Medal

The Society's Medal was awarded to :—

Mr. T. Spence, for breeding the Purple-capped Lory, *Domicella domicella.*

Mr. E. N. T. Vane, for breeding the Canary-winged Parrakeet, *Brotogeris versicolurus chiriri.*

Arthur A. Prestwich,
Hon. Secretary.

STUDIES ON GREAT CRESTED GREBES

By K. E. L. Simmons (Tilehurst, Reading, England)

Illustrated by Robert Gillmor

(*Continued from page* 13)

2. Routine and General Habits

In spite of its being active only during the daylight hours, the Grebe spends many of these resting, in the attitude so well described by Selous as resembling a pork-pie.

Julian Huxley, 1914 : 556.

Grebes resting on the water frequently shake a leg above the back or roll, their satiny under parts flashing, as they preen their feathers.

T. A. Coward, *The Birds of the British Isles.*

Research into bird life-history is apt to concentrate on the more spectacular aspects, for very understandable reasons. Still, birds spend a good deal of their time in rather humdrum, routine activities which are, nevertheless, full of significance to them and full of interest to the observer. This second section describes the general habits of the Great Crested Grebe. It is based mainly on my own notes but the paper of Hanzák (1952) has been a most useful source of extra detail on many points, especially feeding behaviour.

The two quotations above highlight an essential aspect of the grebe's daily life. At the Burghfield gravel-pits in winter the Great Crested Grebes alternate between long periods of relative inactivity, spent mainly in resting and preening, and bouts of diving for food. The hunting birds are spaced out in the shallower water near the main banks and islands. The resting birds tend to gather together very loosely, never in close packs, and sometimes a few mingle among flocks of Tufted Duck and Pochard. Paired birds may keep company during the resting periods but often separate afterwards. Some grebes show spasmodic, short-lived hostile behaviour, especially on finer days, but this is rarely serious. Attacks are very occasionally pressed home and are not always confined to other grebes. For instance, elsewhere I have seen a Goosander (*Mergus merganser*) " torpedoed " by a particularly pugnacious bird. Courtship of any sort is quite rare in November, though it may occur in December and January if the weather is mild.

From the time that the grebes first start to come into active breeding condition usually from February onwards at Burghfield, life becomes increasingly more complicated by the appearance of many extra activities. Time has now to be found for courtship, hostile behaviour, nest-building and so on. There is quite a hectic surge of reproductive patterns which cuts seriously into the time previously spent mainly

resting, preening, and digesting. Most feeding is now done in the early morning and late afternoon. When the incubation-period is reached much leisure is again available. Male and female usually meet now only at the nest, and display virtually ceases. When the young appear, there is a second period of increased activity, mainly in hunting, which is, however, not nearly so marked as in the pre-parental stages, and still leaves much time for the traditional resting and preening.

Swimming, Flying, and Walking

Great Crested Grebes swim well on the surface, but really come into their element below the water, as I shall outline in the next section. When moving unhurriedly, they seem to glide effortlessly along with little or no visible action of head or leg to disturb the water, and with the neck held vertically. The body lies rather low in the water, not high like a gull, and the white underparts are usually invisible. Unless engaged in preening or carrying young, for example, grebes tuck their wings well away, tightly pressed to the flanks where they are covered over by the feathers, and against the back so that they do not protrude and break the smooth contour. When swimming quickly, the grebe inclines its neck forward to an angle of about 45 degrees, and may jerk the head a little. The surface-speed is from 3–7 kilometres an hour (Hanzák), that is approximately 1·8–4·3 miles per hour. However, as Coward (1920) points out, if a grebe wants to make real speed from place to place it will dive.

Grebes do not fly far once they have settled down on a home water. Short excursions, low down over the surface are not really infrequent, especially when birds are attacked by others. In this respect, most grebe species differ from the divers which spend a good deal of time on the wing. Great Crested Grebes must periodically fly from water to water, when migrating or performing weather-movements away from ice. They are good fliers when fully airborne. Their relatively small wings give them a high loading which demands a very rapid beat. According to Meinertzhagen (1955), this is somewhere in the region of 360–400 beats a minute (over 6 a second), approximately twice as many as a Mute Swan makes, and over three times as many as the Heron. In flight, the Great Crested Grebe's pattern and silhouette are unmistakable: the double white wing-patch is conspicuous, the legs extend backwards and slightly below the general level of the body, while at the other end the long neck sticks out with a slight droop in it.

Because of its small wings, the grebe does not find it easy to take off from the water. It has to patter some distance over the surface, legs moving alternately and wings waving, before it gets enough lift to

take it up. Then it must circle round and round many times to gain height. When landing, grebes approach the water at a narrow angle. Their feet start to come down as the surface nears, and may even skim it but, unlike most other aquatic birds, grebes alight breast first and skid forward some way before stopping.

Great Crested Grebe in flight.

Major journeys are made at night. Possibly, like water-beetles, Great Crested Grebes are attracted to a water glimmering in the moonlight. However, so far as I know, no death dives on to greenhouse roofs have ever been reported. There is one strange record, apparently reliable, of five grebes " resting " in a ploughed field near Chipping Norton on 20th February, 1949 (Report Oxford Ornith. Society). No other details were given, but it seems likely that these misguided birds were drawn down to a damp field shining in the moonlight. Perhaps the grebe found shuffling along in the public gardens in Market Street, off the Caledonian Road (London), in January of this year, had been similarly deceived by reflections.

The Great Crested Grebe can stand upright on land quite well, and even move short distances slowly and surely. Its efforts on the limited area of the nest, though by no means nimble, are not too grotesque. When it does have to cover much ground, though, a grebe's actions are ungainly and even pathetic because the legs are placed so far back on the body, forcing it to shuffle forwards on the flat of the tarsi. Grebes rarely come to firm land. Coward (1920) records that in fine weather they may leave the water to sun themselves on the bank. Not all grebe species move so clumsily on land, for Coward found that the Red-necked Grebe (*Podiceps griseigena*) walked easily.

Diving and Hunting

Great Crested Grebes dive for many reasons. For instance, this is their best means of travel, their method of obtaining most food and nest material, their way of safe escape from certain enemies, and so on. In the matter of escape, grebes dive from those foes that are capable

of following them underwater only when threatened from beyond a certain critical distance. Thus they fly and skid over the surface, and do not submerge if attack is imminent at close quarters, especially from underwater. They do, however, dive away from close approaching surface-bound predators such as gulls and man. Gulls will sometimes hover above hunting grebes in the hope of snatching a meal. Whether the latter have fish or not, they usually crash-dive suddenly if a gull comes too near. One grebe dived in this way when a Heron flew low over it. The simultaneous disappearance below the water of a whole grebe family in such circumstances is a striking sight.

When about to dive of its own will, a Great Crested Grebe usually stops swimming, sinks low in the water so that the neck is often awash, and depresses the tippits. Then with a forward swing of the neck it disappears smoothly below. This easylooking action obscures the power behind the dive. Because, in normal circumstances, there is no marked surface disturbance, the legs obviously do not kick back powerfully to play an important part in sending the grebe into the depths. Most of the initial impetus is obtained by the downward swing of the head, and probably also by a springing jerk of the body. This last is obscured because the bird's body lies so low in the water as the grebe reduces its buoyancy before diving. Sometimes, when the dive is made from a more buoyant floating or swimming position, the forward spring can be seen. When a grebe crash-dives in an emergency, it may then give a strong kick backwards and raise quite a spurt of water.

With the wing-feathers tightly folded and neck extended, the grebe is transformed underwater into an elongated, torpedo-like creature of great efficiency. The legs strike backwards together with force, maximum push being obtained by the expanded lobes and the flattened hind edge of the tarsi. Drag is reduced to a minimum in the forward movement : the toes are pressed together, lobes folded away, and the keeled front edge of the tarsi cuts through the water keenly. The length of time spent without surfacing varies and depends on many factors. The depth of the water itself is unimportant, as Hanzák points out. Generally, grebes spend less than half a minute underwater at a stretch, though some dives last nearly a minute. Hanzák, and Harrisson and Hollom give 24 and 26 seconds respectively as the average duration of a dive, with ranges of 12–56 seconds. In some circumstances, Great Crested Grebes can survive underwater for much longer periods : I once saw a bird held under the surface for at least three minutes by an aggressive rival, with no apparent ill-effects.

After emerging from a dive, a grebe may shake its head a few times, presumably to get rid of water droplets on the bill.

The Great Crested Grebe is essentially a fish-eater, and several

shallow-water species are taken. These are normally between four and six inches long, though much smaller ones are given to the young, and occasionally eaten by the adults. Many water-haunting insects are also captured but, compared with the total bulk of fish consumed, are a small if regular item of diet. Algae, pond-weeds, and other vegetable matter are also sampled (though the Great Crested is far less dependent on these things than the smaller Dabchick), and also spawn, crustacea, newts, and tadpoles. Grit has been found in the stomachs of dead grebes, and probably aids digestion.

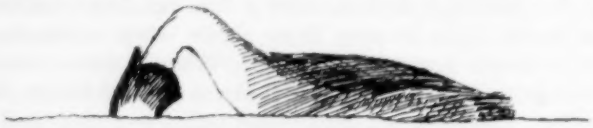
It is in the role of fish-hunter that the grebe excels. The birds may fish at any hour of the day, especially in winter and when feeding young, though otherwise in the summer they tend to hunt mainly in the early morning and in the evening, as pointed out by Hanzák. In good light and on calm water, optimum conditions, the grebe can easily sight its prey from above when swimming slowly, looking downwards through the water. When it sees a suitable fish, it dives and pursues it. The eyes of a Great Crested Grebe, like those of all diving birds, are specially equipped for seeing under water efficiently. Problems of accommodation, and the loss of refractory properties by the cornea underwater, have been solved by a marked development of the muscle controlling the shape and thickness of the lens itself.

Swallowing a fish.

If a fish is caught it is always brought to the surface to be eaten. The grebe usually holds the wriggling creature firmly just behind the head, and may spend a little time in getting a suitable grip and in shaking it before swallowing. Sometimes the bird relaxes its hold, or even places the fish in the water to get a better grip. If the fish gets away, the grebe pursues it again, generally successfully. The fish is swallowed whole and alive, head first, sideways on. The struggles of a grebe trying to choke down a large one are fascinating to watch. The gourmand stretches its neck up and gulps away with marked ducking movements, bill wide open. So tiring is the whole business, that the grebe may pause for a rest. Then one can see the rather

macabre sight of a slowly beating fish-tail protruding from the wide gape and greatly distended throat. After swallowing slimy food, the grebe washes its bill. Because its staple diet is so bulky, the Great Crested Grebe can quite quickly eat its fill. It has no crop, of course, and fish pass straight to the stomach where they take some time to digest. Hence the long inactive periods. Hanzák states that the remains of one or two fish are normally found in the stomach of shot grebes, and cites the Czech record of one bird found to contain "one *Perca fluviatilis*, 12 cm. long, two *Acerina cernua* of 7 and 8 cm., two *Lucioperca lucioperca* 6 and 9 cm. long."

Sometimes, instead of peering down through the surface layer, the hunting grebe will submerge its head to just above eye-level and search in that way. It may swim about for several yards without



Hunting—head submerged.

raising its head, though often it remains dipping and turning on the spot. Hanzák says that this head-under-water hunting method is used only on windy days when the surface is rippled. I have seen it on calm days in summer as well when, I think, the grebes are looking for small, swimming aquatic invertebrates and also for tiny fish to give the young. Insects, etc., may be picked up on the surface and, occasionally, flying gnats snatched from the air, the grebe jumping up partly out of the water to do so, as first noted by my friend R. W. Crowe (1951). I once saw a moth taken in this way. When hunting in very shallow water, the bird may "up-end" rather clumsily, with only a small part of its rear visible.

Great Crested Grebes drink in the same way as most birds, scooping up water in the bill and then tipping back the head to allow the liquid to trickle down the throat. A minor point may be made about such ordinary actions as drinking and bathing. It might seem unnecessary for such an aquatic species to have to make deliberate efforts to do these two things. Yet, it is absolutely essential for grebes *not* to swallow water or to get wet except deliberately at selected times.

Feather-eating

This curious habit of the Great Crested Grebe, which it shares, apparently, only with other fish-eating grebe species, although well known, has not been properly understood until quite recently. Smaller contour-feathers are eaten, usually those that have come out during preening bouts. Adults will give feathers to their young, sometimes

after deliberately soaking them, and the chicks later learn to eat their own feathers and to pick up others floating on the water.

Various theories have been suggested to explain this behaviour, but Hanzák shows, convincingly I think, that none stand close examination. Although whole feathers from all areas of the body, especially the under parts, may be found in the stomach, these later break down into " a special mush-like substance, which under the microscope proves to be composed of fragments of radia and cilia of the swallowed feathers ". This felt-like material envelopes the sharp parts of the food (fish bones and chitinous remains), and makes them easier to eject from the stomach.

Resting, Preening, and other Comfort-Movements

It is not surprising that a species with so much leisure as the Great Crested Grebe has developed quite a variety of comfort-movements, many of which have been modified to suit its aquatic way of life.

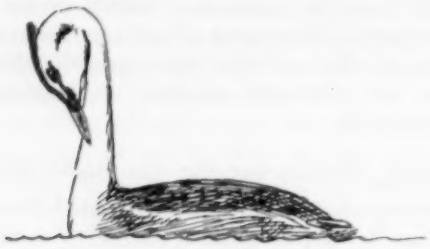
Resting.

When in the famous " pork-pie " attitude, with its head settled on its back and bill tucked away at the side of the neck, a resting grebe transforms itself into a compact bird quite unlike an active one with long, hosepipe neck. This relaxed position is assumed both in the water, where the grebe may sometimes swim forward without lifting its head, and on the nest. In the winter, and also in summer if they are not attached to a nest-site, the birds rest by day and roost at night in the open, deeper water. When nesting, they spend much of their rest-time in or near cover by the platform. A lone grebe, resting near a likely breeding place, is often an off-duty bird " on station " while its mate incubates out of sight in the vegetation.

The preening movements do not differ in any essentials from those of many other aquatic birds. The Great Crested Grebe has both the nibbling and the smoothing (or stropping) bill actions, the former for carefully dealing with individual feathers, the latter for the more general treatment of larger tracts. Special care is taken of the white underparts, as previously mentioned (p. 7). The grebe rolls over on its side in the water, bends its neck round and down, and strops away with closed bill. Both its legs stay in the water and sometimes it paddles the uppermost one to keep balance. I have never seen a Great Crested Grebe roll almost completely on its back as Guillemots (*Uria aalge*) and Razorbills (*Alca torda*) will do. Another conspicuous

and common activity is the preening of the upper throat : the grebe stretches up its neck to the full, tucks its bill down without bending the neck, and makes rather uncomfortable-looking up and down preening movements.

Intermittently during preening a grebe will shake its head to detach feathers, etc., from the bill.



Preening the throat.

While occasionally a bird dips its bill into the water before making preening movements, usually it squeezes the gland on the base of the back every now and then to obtain preen-oil. This is distributed by the bill to the various accessible feather tracts. The head itself is oiled by rubbing the nape and sides of the face on the gland, and these in turn may be smoothed against other parts of the body, particularly the flanks. Often when a grebe is oiling itself, the small bunch of feathers, which is its apology for a tail, sticks up almost vertically. Probably this has something to do with the opening of the gland itself.

It is very significant that two activities connected with preening —tail elevation, and the shaking of the head—are also found in the head-shaking courtship display. Further, " habit-preening " a ritualized displacement-preening movement in which the bird jerkily bends its head back and symbolically raises some of the wing feathers, is a common accompaniment of the display. All this suggests that the head-shaking courtship is partly derived from functional preening. This will be discussed more fully in a later section.

In scratching the head the Great Crested Grebe rather reminds me of a dog as it bends its head down and brings the leg straight up without lowering the wing. There are several stretching movements. When performing the familiar simultaneous extension of foot and wing, the grebe sees to it that the wing does not enter the water. The wing-gliding movement shows the white secondary patches up conspicuously as the wings are held out horizontally over the water, still or gently waving, perhaps for several seconds at a time before being flicked to a close. The forward stretching of the neck right out along the water, with only the head raised, is quite a bizarre sight, while the

waving of one foot in the air, as the grebe lies leisurely over on one side in the water, is another characteristic pose of the relaxing bird. Sometimes the tarsal joint may be straightened and the foot extended right back behind the body, so that it lies on, or just below, the surface. The grebe may even swim forward with one leg inactive like this.

Body-shaking is another common habit. The grebe stops swimming and pauses fractionally, so that it may drift back on its course slightly. It fluffs out the body feathers and then, swimming on again, lunges forwards and upwards, partly out of the water, with neck extended, before resettling, feathers back in place. When lunging the grebe momentarily looks rather like a white rounded bottle with a straight long neck. Wing-flapping also follows a similar pause in swimming.

Wing-flapping.

The bird rises in the water and rapidly flaps its fully open wings a few times. Strangely enough, Kilham (1954) seems to mistake this extremely common comfort-movement, which most water-birds have, for a form of courtship in the Pied-billed Grebe (*Podilymbus podiceps*).

Bathing

Although grebes are continuously in the water they still need to bathe now and then for, normally, of course, no water gets past the well oiled outer layer of feathers. The bird uses special movements to wet itself. These are, principally, a vigorous ducking-scooping action of the head, followed by the shuffling and beating of the folded and partly submerged wings. All this throws water over the neck and body. Preening, body-shaking, wing-flapping, and all the other comfort-movements follow and interrupt the bathing ones.

Sometimes, bathing takes on a special, rather "frantic" looking form. Instead of calmly shuffling and beating the wings, with the body in the usual horizontal swimming position, a grebe may do these movements exceptionally violently while swimming forward with very

powerful use of the feet, and with the body upright, almost vertical in the water, rear-end fully submerged. The tippits are expanded, unlike in normal bathing when they are relaxed. The head may stay still, neck curved, or be stretched down the back doing rubbing, oiling movements of a particularly rapid kind. I have only rarely seen the start of this strange performance which no words of mine can describe convincingly. Three times it has followed aggressive encounters with other grebes, and twice crash-dives—once definitely after the close approach of a Black-headed Gull (*Larus ridibundus*). Once the behaviour has been initiated, however, *no diving occurs*, and sometimes the grebe submerges its head, obviously *looking below the surface* for something. All this suggests a type of " escape " bathing, vaguely resembling that recorded in ducks (Lebret, 1948). The latter, however, perform the definite actions of escaping from a flying hawk, though no such enemy is actually present. Lorenz (1954), speaking generally of this sort of behaviour, emphasizes that the emotion normally responsible for it is absent in the " play " version. The behaviour of the Great Crested Grebe seems psychologically different: I believe that it actually feels afraid in an indefinite way, and has some underwater predator " in mind ", probably the pike.

Voice

Though not so weird as the wails and moans of the divers on their breeding pools, the voice of the Great Crested Grebe is certainly strange to human ears, being chiefly made up of barking, throaty, and rolling sounds. As would be expected in a species of no great intelligence, the grebe has a stereotyped vocabulary, each call being the expression, more or less, of a definite mood. An experienced observer can thus tell quite easily what a hidden bird is doing by the sound of its voice. The more important of these calls will be described in the appropriate sections dealing with the behaviour associated with them.

Great Crested Grebes are most vocal when in reproductive mood, their notes then being mainly expressions of hostile, self-assertive or sexual tendencies. Because it is very specialized for visual display, the Great Crested Grebe has not a very elaborate vocabulary. On the other hand, the Dabchick, that relative plain-Jane of grebes, partly makes up in its voice for what it lacks in display structure. I believe that the " trilling " of Dabchicks, often performed in duet, largely takes the place of the usual head-shaking display of the bigger bird.

(*To be continued*)

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LONDON ZOO NOTES

By J. J YEALLAND

A further examination of the Sierra Leone Sunbirds has revealed that one of the supposed Kemp's Olive-bellied was a Tiny (*Cinnyris minullus*). This is of interest because of being the first record for Sierra Leone. The birds are so alike that they could scarcely be distinguished except on very close examination. One of the Superb has proved to be the Crimson-chested Superb (*C. johannae fasciata*), a subspecies of Madame Verreaux's or Johanna's Sunbird of further east.

At the Society's scientific meeting in February, Mr. Lester showed a film of the Picathartes nesting. One wonders how such a bird, presumably unable to cling to an overhanging rock face as, for instance, a Martin would do, is ever able to build its mud nest in such a place.

The taxonomic problem set by these curious birds was humorously illustrated in the course of the subsequent discussion, when Mr. Macdonald, the Keeper of Birds at the Natural History Museum, read Mrs. B. P. Hall's verse :

What is this bird,
Pied, bald, absurd,
What is this Picathartes ?
" It's not a crow," said Dr. Lowe,
" Let's cut him up, my hearties.
This ugly fowl with painted jowl ;
Its oddities concern us ;
Now bone by bone has plainly shown
It's cousin to the *Sturnus*."
But Amadon has frowned upon
And called this name a failure,
" And what is more," said Delacour,
" It's allied to *Timalia*."
Now Dr. Serle has joined the whirl,
And thus begins his treatise,
Ignoring place by form and face,
He says it's like *Eupetes*.
Though this is queer, he thinks it's clear,
He's seen the brute moreover ;
The creature lays, or so he says,
Pyrrhocoracian ova.

Those who have seen the living birds will probably agree with Delacour and Amadon (*Ibis*, vol. 93, p. 60) when they say, " . . . we believe that Picathartes has far more in common with babblers than with starlings, crows, or other passerine families."

Three Red-crested Bustards (*Lophotis ruficristis*), new to the Collection, have been presented by the Antwerp Zoo. Others not exhibited before in Regent's Park are a Malayan White-collared Kingfisher (*Sauropatis chloris humii*), and an Eastern White-breasted Waterhen (*Amaurornis phoenicura chinensis*), both presented by Squadron-Leader K. C. Searle, who also sent a Lesser Blue-winged Pitta (*Pitta cyanoptera*); four Malayan Glossy Starlings or Glossy Calornis (*Aplonis panayensis strigatus*); two Nutmeg Pigeons (*Ducula bicolor*), and an Eastern Grey-headed Gallinule, which used to be known as Milne-Edwards' Gallinule (*Porphyrio poliocephalus viridis*).

A further twelve Budgerigars have been presented, bringing the number in the new aviary to over a hundred.

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BRITISH AVICULTURISTS' CLUB

The forty-sixth meeting of the Club was held at the Rembrandt Hotel, Thurloe Place, South Kensington, S.W. 7, on Wednesday, 9th March, 1955, following a dinner at 7 p.m.

Chairman: Miss P. Barclay-Smith.

Members of the Club: Mrs. H. G. Alderson, P. C. Bath, Hylton Blythe, Miss K. Bonner, Mrs. V. M. Bourne, Captain A. A. Clarence, T. Crewes, A. H. D'Aeth, Sir Godfrey Davis, W. T. Dring, Mrs. W. T. Dring, B. H. Dulanty, O. E. Dunmore, Sqd.-Ldr. C. Everitt, Miss S. A. Fothergill, Miss B. Francis, J. C. Garratt, Miss D. Gask, A. G. Glenister, F. Grant, H. J. Harman, R. E. Heath, Dr. E. Hindle, Dr. R. S. Kirk, Miss E. M. Knobel, Miss M. H. Knobel-Harman, Dr. F. B. Lake, Mrs. E. M. Lonsdale, G. C. Lynch, P. H. Maxwell, G. S. Mottershead, S. Murray, Miss E. G. Perry, S. Porter, A. A. Prestwich, Miss A. Reed, D. H. S. Risdon, R. C. J. Sawyer, H. A. Snazle, A. C. Soanes, P. Sutton, J. A. Swan, E. H. Tong, E. N. T. Vane, N. S. Walker, H. Waller, C. H. Wastell, H. Wilmot.

Guest of the Club: D. Seth-Smith.

Guests: Dr. K. Aylwin-Gibson, J. Bailey, Mrs. P. C. Bath, Professor J. Berlioz, E. St. J. Blunt, M. E. Chatfield, B. R. Cordwell, S. A. Croucher, Mrs. S. A. Croucher, Lady Davis, Mrs. O. E. Dunmore, Mrs. C. Everitt, D. C. Garratt, Miss H. Gentry, Mrs. F. Grant, Mrs. F. B. Lake, Miss D. G. Lonsdale, H. M. Luther, Sir Philip Manson-Bahr, Lady Manson-Bahr, Mrs. S. Murray, Mrs. G. H. Palmer, C. M. Payne, Mrs. C. M. Payne, J. Roddis, Mrs. M. E. Roddis, A. H. Rudd, Mrs. A. H. Rudd, S. Sanderson, Mrs. D. Seth-Smith, Dr. D. W. Seth-Smith, Mrs. D. W. Seth-Smith, A. E. Sibley, Mrs. E. Stewart, Mrs. P. Sutton, Mrs. J. A. Swan, R. A. Taylor, Mrs. E. H. Tong, Mrs. D. F. Waller, Mrs. H. Waller,

Mrs. C. H. Wastell, Miss H. Wastell, L. R. Williams, Mrs. H. Wilmot, W. A. Wood, A. J. Woods.

Members of the Club, 49; guest of the Club, 1; guests 46; total, 96.

After the Loyal Toast the Chairman said that by a happy chance the date of the meeting coincided with that of two birthdays—Mr. Jim Bailey and Mr. David Seth-Smith. After the members and guests had responded to the toast of "Mr. James Bailey", the Chairman gave a brief outline of the very long, intimate connection Mr. Seth-Smith had had with the Society, from its foundation in 1894, when he was a dashing young man of 19, to the present day, his eightieth birthday.

After drinking Mr. Seth-Smith's health, the lights were lowered, the toast-master brought in a birthday cake blazing with eighty candles, and the company rendered a somewhat unmusical vocal birthday refrain.

Dr. D. W. Seth-Smith said he most sincerely thanked the Club for the honour it had done his father. And, being in reminiscent mood, he went on to say that some of his earliest boyhood recollections were of aviaries, birds, and their breeding; and later, of a mysterious publication, the production of which seemed to clutter up most of the house, and, on certain days of the month, necessitated complete quiet, as "father was busy with his magazine".

Mr. Seth-Smith then said how delighted he was to be the recipient of so many good wishes, and he greatly appreciated the great welcome the Club had given him. His long association with the Society had given him much real pleasure. He had watched it grow from its very modest beginning with little more than a pamphlet of only a few pages, into a Society with a world-wide membership and a Magazine in the forefront of ornithological journals. And, he was delighted to say, in the whole of its history it had never been in a more flourishing state, in no small measure due to the efforts of the members of the Club. He could wish nothing better than that both should enjoy even greater success in the future.

The Chairman said how honoured and delighted the Club was to have as a guest Professor Jacques Berlioz, of the Paris Museum of Natural History.

The speaker for the evening, Sir Philip Manson-Bahr, really needed no introduction, being one of the Club's favourite guests. Sir Philip and Lady Manson-Bahr have but recently returned from East Africa, where they visited four of the big Game Reserves. Sir Philip showed a collection of his paintings, Kodachrome slides, and coloured films, combined to illustrate "African Adventure", and gave a running commentary in his own inimitable manner. The most remarkable part of the showing was a series of surely unique photographs of Kilimanjaro at sunrise. We were also shown excellent pictures of

elephants, rhinoceroses, buffaloes, giraffes, zebras, lions, hyaenas, hippopotami, and various deer ; also of pelicans, cormorants, ibises, storks, crowned cranes, bustards, white-headed eagles, peregrine falcons, Egyptian geese, and numerous ducks.

At the conclusion the large audience showed by its applause, which without exaggeration could be described as vociferous, that it had fully appreciated Sir Philip's efforts to instruct and entertain it.

The next meeting of the Club is on **11th May, 1955.**

ARTHUR A. PRESTWICH,
Hon. Secretary.

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NEWS AND VIEWS

Professor Alessandro Ghigi, of Bologna, celebrated his eightieth birthday on 9th February, 1955, and a telegram of congratulations was sent by the President and Council of the Avicultural Society.

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Last season, 1954, Norman Nicholson bred Red-headed Parrot Finches to the twenty-second generation.

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R. A. Patten retired recently from Taronga Park and has recommenced a veterinary practice in Kellyville, N.S.W.

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Adelaide Zoo.—Amongst the birds bred recently are : Two broods of Egyptian Geese, 4 Swinhoe's Pheasants, 3 Ruddy Sheld-Ducks, 2 Leadbeater's Cockatoos, Crimson-winged and Queen Alexandra's Parrakeets.

* * *

M. Walter Van den bergh, Director, Société Royale de Zoologie d'Anvers, has been granted the Croix de Chevalier de l'Ordre de Leopold by the King of the Belgians, and has also been created an Officier avec couronne de l'Ordre du Mérite Civil et Militaire d'Adolphe de Nassau by the Grand Duchess of Luxembourg.

* * *

A. H. Isenberg, Woodside, California, has now completed his new greenhouse aviary : this houses 170 birds of 80 species. There are now over 800 birds (all soft-bills) in the Isenberg collection. 1954 again produced five Ptilogonys and two Indian Brown Robins—the latter nesting in boxes. Grey Struthideas had five nests and seven young but none was reared, due to too many other birds in the

same aviary. White Eyes reared three and a pair of Jilgieros sat on eggs but none hatched.

* * *

P. W. Teague still manages to hatch and rear a few Gouldians, just to keep his record intact—since 1926. A really outstanding nesting record was put up by a pair in the autumn of 1950. They had three nests in quick succession—in fact the second nest of eggs was laid in the same nest before the first youngsters had left it. First nest, 8 eggs, all hatched and reared ; second nest, 8 eggs, again all hatched and reared ; third nest, another 8 eggs, 7 hatched and reared but two young died later on. Twenty-one of the 23 young hatched were fully reared and passed safely through their first moult !

A. A. P.

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REVIEW

VOGEL IN KAFIG UND VOLIERE (Cage and Aviary Birds). By Dr. JOACHIN STEINBACHER and H. E. WOLTERS, with the collaboration of numerous other ornithologists. 1st Part : DIE PRACHTFINKEN (Waxbills). In approximately 22 sections. H. Limberg, Aachen, 1954–55. Price DM. 2.80 per section.

This is a most valuable work of great interest to aviculturists. A short description is given of each species, with details of its distribution, races, and account of the song, calls, nesting, and behaviour in the wild. This is followed by full information on the bird in captivity, with details of importations, its reactions to captivity, conditions necessary to maintain it in good health, food, breeding, etc.

The text is illustrated with black and white drawings of the birds, which are unfortunately not of very high standard, and maps showing distribution. In addition are coloured plates depicting several species, for instance there is one of the Waxbills of Senegal and another of those of East Africa. The names of the birds are given in Latin, German, English, French, and Dutch.

Each Section contains about twelve pages, and it is somewhat irritating that they sometimes end in the middle of a sentence. So far, Sections 1–9 have appeared, and deal with forty-four species.

Dr. Steinbacher is well known to all readers of the *Avicultural Magazine*, and all those interested in this group of birds should certainly take advantage of his wide knowledge and experience, by obtaining this work. A loose-leaf binder to hold the Sections is issued, and can be purchased from the publishers, price DM. 3.40.

P. B-S.

MEMORIAL TO THE LATE DUKE OF BEDFORD

The memorial plaque which is to be placed in front of the liberty Budgerigar Aviary at the London Zoo, will be unveiled by the Duke of Bedford at 12.15 p.m., on Monday, the 18th April, 1955.

Subscribers to the Duke of Bedford Memorial Fund who wish to attend the ceremony are asked to communicate with the Hon. Treasurer, Mr. R. C. J. Sawyer, 226 Haggerston Road, London, E. 8, who will forward an invitation.

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NOTE

Sula Island King Parrakeet

At some time between 1930 and 1936, the late Duke of Bedford received a newly-imported Sula Island King Parrakeet. It was in poor plumage, and as it showed no sign of improvement, it was given during 1936 to a lady at Merton Park, Surrey. This bird is still living, and in 1954 it laid an egg. It appears to be in good health with no sign of senility, but its plumage is still in a poor condition in spite of years of good treatment and a largely outdoor life during summer.

J. J. Yealland.

* * *

CORRESPONDENCE

PROFESSOR CARL NAETHER'S ARTICLE: "SOME REFLECTIONS OF A SOFTBILL ENTHUSIAST"

I do not write this as a condemnation of a great softbill keeper, who I fully realize is worthy of my respect, and has done much for the softbill fancy in general. On the whole, I thoroughly enjoyed his article, and certainly learnt a few points from it, but was extremely disappointed at his attitude towards breeding. To my mind, the establishing of aviary strains by breeding is the highest attainment possible in aviculture, and I say this as a keen exhibitor and judge, with an interest in all phases of aviculture. A casual, disinterested attitude by experienced and respected fanciers must of necessity do harm by discouraging others of less experience from trying their hand at achieving results as breeders. I feel deeply on this subject as practically all the few foreign softbills left in Australia are the result of one fancier's efforts; the same interest by other fanciers who had breeding pairs would have meant a far larger and varied foreign softbill population than there now is in Australia.

Fanciers everywhere must realize an import ban or misguided protection bill could easily put them in a similar position. It is up to all keepers of softbills to try to breed them, and for all who have done so to place their experiences in the hands of the Editor. Then others like myself, who are keen to become successful breeders, can use their experiences as guidance and this will also encourage others to try their hand at breeding, when I'm sure they will find the most pleasing song of all comes from a nest of lusty young calling for food.

Roy A. Scott.

1 Lambton Road,
Broadmeadow,
N.S.W., Australia.

MARKED WHITE ZEBRA FINCHES

As I was the originator of this variety, it is with some concern I read of Mr. Edward Boosey's continued reference to them as "Chestnut Flanked Zebras" and must assume that the stock he has is of very poor quality. Good specimens of this variety have the cheek patches, barring on the chest, and markings on the flanks just as strong as in the grey variety. In consequence the name "Chestnut Flanked" in no way describes the bird. Admittedly the name "Marked White" is not very imaginative but it does, to a small extent, describe the bird. Perhaps when Mr. Boosey sees some good specimens he may suggest a more suitable name.

Although I was the first to breed the "Marked White" Zebra Finches in Australia, I had nothing to do with the name eventually adopted.

N. V. WHITEHOUSE.

183–5 GEORGE STREET,
BRISBANE, AUSTRALIA.

THE USE OF NECTAR IN FEEDING BIRDS

With reference to the recent correspondence on the use of artificial nectar for feeding birds, my own experience may be of some interest to your readers.

While waiting for feeding bottles of the type in use at the London Zoo to be sent from England, I have been forced to fall back on small open china vessels to feed my sunbirds (the Malayan Yellow-breasted) housed in a mixed garden aviary.

It was to be expected that Zosterops would make use of this food, but I was intrigued to observe that Yellow-crowned, Red-whiskered, and Red-vented Bulbuls, Pekin Robins, Malaysian Glossy Tree Starlings, and even a Lesser Blue-winged Pitta all took the liquid avidly. My original delight at having an additional constituent for the diet of these birds has since been tempered by the constant watch that is necessary to prevent the sunbirds being starved! However, this minor drawback will be easily remedied when the glass feeding tubes arrive. Although I have some of the species of seed-eaters mentioned by Mr. C. R. Podmore in the same aviary, I have yet to see them, or any of the other finches present, visit the nectar pots.

It is a common sight in Singapore to see parties of Yellow-vented Bulbuls feeding on the blossoms of garden trees, and when such trees are flowering they will often be swarming with the above and sunbirds, and one is forced to the conclusion that with this species at least nectar is normally taken by bulbuls when available.

KENNETH C. SEARLE.

STATION OFFICERS' MESS,
R.A.F., CHANGI,
SINGAPORE, 17.

WALTER GOODFELLOW

I was very sorry to read in the *Avicultural Magazine* of the passing of Walter Goodfellow. He was undoubtedly a first-class collector and ornithologist, and his early travels showed that he was a man of much courage with the same spirit as the great explorers.

When I was in Papallacta, an Indian village on the east side of the Andes of Ecuador, situated at about 11,500 feet, I met a half-Indian blow-gunner who, in the course of conversation, told me of a man named Señor Goodfellow who had passed that way some twenty-four years before. When I said I knew him well his face beamed, and he said with some feeling, "he was a great man." With that simple tribute I think all who knew him will agree.

CECIL S. WEBB.

THE ROYAL ZOOLOGICAL SOCIETY OF IRELAND,
PHOENIX PARK,
DUBLIN.

THE AVICULTURAL SOCIETY RECEIPTS AND PAYMENTS ACCOUNT

Year ended 31st December, 1954.

RECEIPTS

	£ s. d.	£ s. d.
To Balance at Bank, 1st January, 1954		820 16 6
„ Ordinary subscriptions		
Arrears	48 2 3	
Current	719 17 10	
In advance	118 11 6	
		886 11 7
„ Life membership subscriptions		75 0 0
„ Avicultural Society of America		
Balance, 1953	16 10 0	
1954	128 0 0	
		144 10 0
„ Donations		100 6 2
„ Sales of Magazines		61 18 4
„ Sales of *Australian Parrots*		22 15 10
„ Sales of *The Anatinae*		46 8 6
„ Sales of surplus books		159 0 0
„ Sales of waterfowl rings		1 17 0
„ Sales of coloured plates		2 18 6
„ Sales, Miscellaneous		5 5 0
„ Advertisements		1 6 3
„ Dividends		36 4 4
		£2,364 18 0

PAYMENTS

	£ s. d.
By Printing of Magazine	1,061 15 1
„ Coloured plates	192 17 9
„ Authors' separates	10 1 6
„ Printing *The Anatinae*	69 18 6
„ Sundry printing and stationery	52 16 4
„ Printer's charges and expenses	6 6 6
„ Honorarium to Editor	100 0 0
„ Secretarial	52 0 0
„ Preparation of Index	10 10 0
„ Newman Library insurance	2 5 0
„ Advertisements	15 0 0
„ Expenses at Council Meetings	4 5 0
„ Medals and engraving	9 11 3
„ Donations	20 10 0
„ Postages	31 13 6
„ Bank charges	12 2
„ Miscellaneous expenditure	9 9 6
	1,649 12 1
„ Balance at Bank, 31st December, 1954	715 5 11
	£2,364 18 0

I have examined the above Account with the books and vouchers of the Society and certify it to be in accordance therewith. I have verified the Bank Balance.

LONDON.
17th February, 1955.

J. WATKIN RICHARDS, *Certified Accountant.* } *Hon. Auditor.*

CANDIDATES FOR ELECTION

F. C. Astles, The Aviaries, Magpie Hall Road, Kingsnorth, Ashford, Kent. Proposed by Hylton Blythe.

S. Aquilina, 30 Hart Street, Semaphore, South Australia. Proposed by Miss K. Bonner.

D. Bean, Netherfield, Inverurie, Aberdeenshire. Proposed by Miss K. Bonner.

Dr. S. Bergman, Rönninge per Stockholm, Sweden. Proposed by C. af Enehjelm.

N. A. Berry, Parattah, Tasmania, Australia. Proposed by A. A. Prestwich.

A. L. G. de Kanter, 22 Thwaite Street, Cottingham, E. Yorks. Proposed by Miss K. Bonner.

B. N. Douetil, 4 Home Farm Close, Thames Ditton, Surrey. Proposed by Miss K. Bonner.

A. D. Fisher, Lower Cathill Farm, Penistone, Sheffield. Proposed by G. Beever.

J. W. Harris, "Roysden," Mayfield, Sussex. Proposed by H. A. Fooks.

L. Hoffmann, Tour du Valat, par Le Sambus, B.D.Rh., France. Proposed by Miss P. Barclay-Smith.

G. Hughes, "Ramblers," Amos Lane, Wednesfield, Wolverhampton. Proposed by Miss K. Bonner.

R. Kreuger, Stockholmsgatan 17, Helsingfors, Finland. Proposed by C. af Enehjelm.

K. J. Lawrence, The Street, Hatfield Peverel, Essex. Proposed by G. E. Whitmore.

T. J. McLaughlin, The Bungalow, Gordon Avenue, Foxrock, Co. Dublin, Eire. Proposed by R. G. Kirkham.

J. O'Neill, 5 Conde Barão, Lisbon, Portugal. Proposed by J. F. Simões.

W. F. Palsson, Halldorsstadir Laxardal, via Husavik, Iceland. Proposed by Miss K. Bonner.

A. G. Ponting, North Owersby, Lincoln. Proposed by Miss K. Bonner.

S. Sanderson, 33 Cardinal Avenue, Borehamwood, Herts. Proposed by A. C. Soanes.

K. E. L. Simmons, Lamorna, Beechwood Avenue, Tilehurst, Reading, Berks. Proposed by Miss P. Barclay-Smith.

Mrs. B. G. Strachan, The Garden Cottage, Thornaflush, Cranleigh, Surrey. Proposed by Miss K. Bonner.

D. N. V. Toplis, Shell Company of West Africa, Ltd., Private Mail Bag 2052, Lagos, B.W.A. Proposed by H. Stiven.

G. F. Townsend, 94 Littledean Hill, Cinderford, Glos. Proposed by Miss K. Bonner.

W. Van Maarion, Nelson Aviaries, 715—6th Street, Nelson, British Columbia, Canada. Proposed by A. A. Prestwich.

H. G. Warner, 83 Sherbourne Road, Bushbury, Wolverhampton, Staffs. Proposed by Miss K. Bonner.

Dr. B. Warren, Curlewis, 86 Crescent Road, Newport, N.S.W., Australia. Proposed by L. C. Webber.

NEW MEMBERS

The twenty-six Candidates for Election in the January–February, 1955, number of the Avicultural Magazine, were duly elected members of the Society.

CHANGES OF ADDRESS

O. E. Dunmore, to 31 Mickleton Drive, Evington, Leicester.

H. A. Fooks, to The Oast House, Down Lane, Frant, Sussex.

D. P. Horne, to Lloyds, Leadenhall Street, London, E.C. 3.

Dr. Wolfgang Merck, to Rupert Strasse 55, Hamburg-Nieustedten, Germany.

G. T. Murray, to 4235 Ohio Street, Gary, Indiana, U.S.A.

R. A. Patten, to "Dunromin", Windsor Road, Kellyville, N.S.W., Australia.

C. M. Payne, to The Malt House, Barford, Warwick.

CHANGE OF NAME AND ADDRESS

Miss B. Adamson, to Mrs. B. Field, Whitebrook, Widbrook Common, Cookham, Berks.

DONATIONS

(Coloured Plate Fund)

	£	s.	d.
A. Lamb . .	2	2	0
J. Seago . .	1	2	0

MEMBERS' ADVERTISEMENTS

The charge for Members' advertisements is ONE PENNY PER WORD. *Payment must accompany the advertisement, which must be sent on or before the 15th of the month to* A. A. PRESTWICH, 61 CHASE ROAD, OAKWOOD, N. 14. *All members of the Society are entitled to use this column, but the Council reserves the right to refuse any advertisements they consider unsuitable.*

WANTED

A Pair of Chukor Partridges.—A. C. FURNER, Oakdene, 155 Whitaker Road, Derby.

Two female Ring-necked Parrakeets and pairs of British Grey Geese.—A. F. MOODY, Lilford, Oundle, Peterborough.

Pairs Rosella, Mealy Rosella, Pennant's, Adelaide, Princess of Wales's, King, Bourke, Blue-bonnet, and Red-rumped Parrakeets.—G. EOUCHARD, 28 Rue Albert 1er, Dunkerque, Nord, France.

Scaup duck, Tufted and Shoveler drakes.—W. G. SALMON, Angley Lake, Cranbrook, Kent. Tel.: Cranbrook 2225.

FOR SALE

Fischer's and Masked Lovebirds, hatched July, 1954, in perfect condition, from outdoor aviaries.—K. GREENWAY, Park Lane, Long Handborough, Oxford.

Surplus copies of coloured plates that have appeared in recent numbers of the Magazine, suitable for framing. Mountain Blue Robins, Green-headed Olive Sunbirds, Scarlet-tufted Malachite Sunbird, Hartlaub's Touraco, Blue-shouldered Robin-Chat, Scarlet Flycatchers, Wattled Starlings, Ceylon Blue Magpie, Falcated Teal, Rock Grass Parrakeet and Elegant Grass Parrakeet, Lineolated Parrakeets, Brown-headed Parrot, Red-bellied Conure, Yellow-cheeked Conure. Price 1*s.* each, post free, from the HON. SECRETARY, 61 Chase Road, Oakwood, London, N. 14.

MINISTRY OF WORKS

Applications invited for the post of Bird-keeper, St. James's Park, London, S.W. 1. Applicants must possess experience of care of ornamental wildfowl, hand-rearing, feeding, ringing, etc. Standard wage £7 6*s.* per week. Average earnings £8 14*s.* per week. House provided. Apply to: Bailiff of Royal Parks, Room 319B, Ministry of Works, Lambeth Bridge House, S.E. 1, not later than 11th April, 1955.

STEPHEN AUSTIN AND SONS, LTD., PRINTERS, HERTFORD.